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ABSTRACT

In an attempt to improve its students' writing abilities, as well as their critical thinking skills, Lord Fairfax Community College, in Virginia, developed a program called "Thinking through Writing." The project designers believed that concept formation, classification, memory enhancement, and other learning/thinking skills could be enhanced by discipline-centered writing. In the first year of the 2-year program, the faculty researched possible methods for meeting both their individual and collective goals. During the second year, individual faculty members utilized the assignments and activities developed during the previous year, and established a research component to measure the program's success. Following a brief introduction, this report on the Thinking through Writing program presents descriptions by 10 faculty members of the activities they utilized and the results they achieved during the project. The collection includes: (1) "Learning Literature Sans Pipe and Tweed," by Felicia H. Cogan; (2) "Critical Thinking through Writing in Chemistry," by Ernie E. Grisdale II; (3) "Thinking through Writing in Business," by Virginia Hartman; (4) "I Was Forced To Think (English)," by Anne L. Legge; (5) "HLT 116 Personal Wellness Classes," by Walter K. Malinowski, Jr.; (6) "Augmenting Critical Thinking through Writing in an Introductory Philosophy Course," by Harold G. McMullen; (7) "Thinking through Writing about Art," by Lahna Neely; (8) "Thinking through Writing (English)," by Nancy Penney; (9) "Teaching Concepts Through Writing in an Anatomy and Physiology Class," by Ramon R. G. Selove; and (10) "Writing To Learn in Introduction to Microcomputer Software," by Gary L. Tusing. Numerous appendixes of sample writing assignments, survey instruments, survey responses, and references are included throughout. (MAB)

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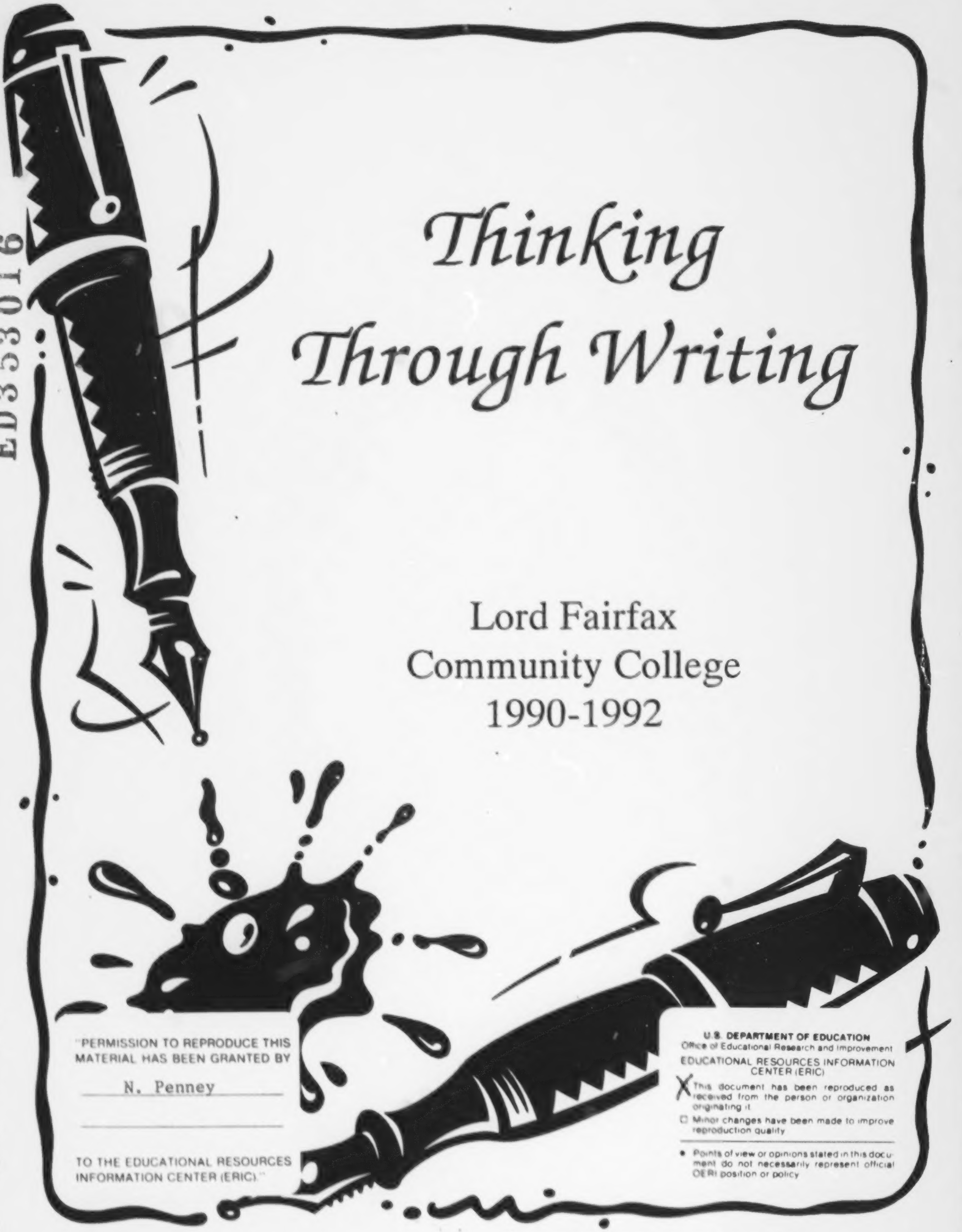

Thinking Through Writing

Lord Fairfax
Community College
1990-1992

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Acknowledgements

As is evident through these articles, the Thinking Through Writing team gained a great deal from their work on this project. Although in differing ways and to different degrees, each team member ended the term feeling that he/she had grown professionally and become a better teacher. We all wish to thank those who helped us achieve this development opportunity.

To the SHEV Staff - Thanks for the opportunity and all the advice and help along the way.

To Dr. Beck and Dr. Perkins - Thanks for your continued support and enthusiasm for our participation in the project.

To Toby Fulwiler - Thanks for planting the seed that led us to develop the project.

To Rick Hogan - Thanks for so much guidance and clarification in the "critical thinking" arena.

To Nancy Hoagland - Thanks for your practical, down-to-earth help in assessing our work and writing up the results.

To Rick Brehm - Thanks for helping so often to unbungle the budget.

Numerous students have benefitted and will continue to benefit from the work done in this project and the part you played in making it so successful.

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Introduction

American education is in a crisis. Teachers at all levels cite their students' inability to read and compute and faculty in every discipline lament the absence of writing skills evidenced by their pupils. The media as well as many educational writers report declining test scores for American students in math, science and languages and point to the dire ramifications for America as a world power if this downward trend continues.

Blame for these deteriorating conditions in education has been aimed at everyone and everything: open/closed classrooms, liberal/conservative administrators, permissive parents, poorly qualified teachers, and, of course, inadequate curricula. The National Commission on Excellence in Education accused the national secondary curriculum of being mechanistic and trivialized and other high level agencies like the National Endowment for the Humanities make the same accusations of our college curriculum. Wherever the blame belongs (probably all aspects could stand improvement), solutions must be found if education is to help America regain a competitive place. Numerous solutions to these problems are proposed: longer school days, extended school years, strict standards and longer programs for educational degrees and numerous others. In general such solutions are costly in terms of time and money and would take years to implement on any significant scale.

Perhaps some or all of these ideas could or should be adopted, but steps need to be taken immediately before America becomes less able to compete in world affairs and business.

Some of the positive steps which have already been taken by many educators, including the State Council for Higher Education and the colleges, universities and community colleges in Virginia include a renewed emphasis on general education, an increased concern with thorough basic thinking/learning skills instruction (process, not product), and a clearer focus on comprehensive and specific assessment plans.

In common with other educators, the faculty and staff at Lord Fairfax Community College are concerned with the importance of equipping our students to meet the ever-increasing, rapidly-changing demands of modern American life and the world we live in. In fact, as a community college our teaching mission is our number one concern, and we want to be certain that our students not only learn the material we can present today but are equipped to learn on their own in the complicated world they will encounter after college.

Like other college and university faculties we find our students come without well-developed thinking and writing skills and, in fact, are often ill-equipped to move from concrete "facts" to more abstract, more sophisticated concepts in every subject area. There has been and continues to be an interest on the part of our faculty in all disciplines to address these areas and make our students better learners, better communicators and better thinkers.

One movement which is gaining popularity as a means of addressing these problems is writing-across-the-curriculum, a program that attempts to increase a student's writing skills by utilizing more writing throughout the curriculum, not just in English/composition classes. Across Virginia there have been numerous projects funded on Writing-Across-the-Disciplines. The LFCC staff agrees that writing is important to every discipline, that scientists or physicists or philosophers who cannot communicate their ideas and discoveries do little to advance knowledge. In fact, Lord Fairfax recently hosted a workshop on the subject conducted by a scholar of national renown, Dr. Toby Fulwiler. Throughout Dr. Fulwiler's presentation the themes of writing as a mode of learning kept recurring. Essentially the workshop focused on the benefits of incorporating writing in all disciplines, not just because to do so would improve writing skills, but because to do so would increase learning. The faculty and staff at Lord Fairfax Community College were intrigued by the premise that writing is inextricably related to learning, knowing, thinking in every discipline and that writing about a subject can show a student what he knows, what he doesn't know and what he needs to know.

Dr. Fulwiler made it apparent in the workshop that five or six years of working with writing in numerous disciplines have convinced him that writing is a cognitive act, a means of thinking and learning, rather that simply a means of communication or an art form.

> Language is the medium of learning in all subjects. We need to look at how we talk, write, and listen to our students as well as how we ask them to talk, write, and listen to us. From the outset I have doubted that student writing is in any better or worse shape than other things students do in the rest of the curriculum: compute, think, create. By now I have convinced myself -- and maybe you -- that the fate of writing and the fate of the total curriculum are intertwined: as one goes, so goes the other. Just as it is easier to highlight surface errors in education than to ask what they mean, why they occur, and how they are allowed to continue. Student writing will improve when student learning does; and student learning will improve when students do more writing. (3)

The work of many researchers, among them Emig, Elbow, Britton, Martin and even Piaget, corroborate the work of Dr. Fulwiler. They assert that writing is an effective learning tool in all courses and allows each student to actively rather than passively participate in his own education.

In an excellent book on the role of writing in thinking, Thinking on Paper, Dr. V. A. Howard and J. H. Barton sum up the basic premise which underlies this project:

> Communication is surely an important objective of writing but not the only one, nor the first. We take a differing view that the first goal of writing, like reading, is to understand; only then can one make that understanding available to others in writing. Thinking in writing is, in fact, a form of understanding...a way of shaping first thought--whereas communication in writing is mostly a matter or re-shaping our thought on paper. In brief, from first thoughts to the last word in writing, articulation precedes communication. (1)
>
> . . .
>
> Three propositions help to explain the complex relations among writing, thinking, and communicating. They are:
>
> 1. Writing is a symbolic activity of meaning-making;
> 2. Writing for others is a staged performance; and
> 3. Writing is a tool of understanding as well as of communication.
>
> Together these add up to the claim that writing is "thinking on paper" in which both writer and reader are witnesses to meaning-in-the-making.... (4)

Two examples which illustrate particularly well the role of writing to clarify thought, or what might be termed the "Ah Ha!" aspect of writing, were provided to Dr. Fulwiler by a chemistry professor. It was obvious from two examples from a chemistry class that the act of writing questions for the chemistry professor's "question box" had clarified for the confused students an important chemical concept.

It is perhaps important to acknowledge here that the term "critical thinking" has not been used thus far in this discussion. That does not mean that critical thinking is not a component of this program. In fact helping students become better critical thinkers is a very important part of all education and particularly a goal of higher education. Several grants have been awarded to colleges across Virginia to fund such critical thinking-across-the-curriculum. We have followed these programs with interest and agree that America's students of all ages need to improve their ability to view the huge amounts of information they receive with an analytical and critical scrutiny.

The project undertaken at LFCC was a somewhat broader one than critical thinking-across-the-disciplines and hoped to improve numerous aspects of student learning/thinking skills through the writing process. We believed that concept formation, classification, memory enhancement and numerous other thinking/learning skills, as well as critical thinking abilities could be enhanced by discipline-centered writing. As noted earlier, numerous researchers do believe that writing is first thinking; then communication. This project was intended to explore the subject in the broadest possible sense--including, but not limited to, critical thinking as a number of other proposals have been.

Ten members of the faculty at Lord Fairfax Community College were interested in working on this project and a grant was submitted to The State Council of Higher Education in Virginia in the spring of 1990. The two year project was approved and funded; it began July 1, 1990. The faculty represented a cross section of disciplines: chemistry, biology, physical education/health, art, English, business, accounting, and philosophy. For the first year, the faculty participants read a number of books and articles on the subject and their disciplines, listened to consultants from a variety of disciplines including Toby Fulwiler who returned to help us decide on the kinds of activities and outcomes desired and brainstormed with us about what we wanted to do and how we could best accomplish our individual and collective goals. Various faculty had different ideas of what they wanted to work with and the kinds of outcomes they hoped to accomplish. While we discussed materials, methods and goals, each faculty member did his "own thing" in terms of choosing activities and working them into his course outlines.

During the second year of the grant, the individual faculty members utilized the assignments and activities that they had developed during the first year and set up a research component that was designed to measure whether the writing-to-learn activities accomplished what was expected. Again, while we discussed our ideas and methods, the research designs were specific to individual faculty members.

Each of the articles that follow was written by one of the faculty participants so each could share the concerns he wished to address, the activities that he chose to utilize and the results that he achieved during this project. We all seem to agree that we learned a great deal during these two years--about students, about writing, about learning, about ourselves, and about each other. We hope that reading about what we did and how we did it will be of value to fellow faculty across Virginia and the country and of benefit to students everywhere.

Learning Literature Sans Pipe and Tweed

by

Felicia H. Cogan

Associate Professor of English

Professor Cogan has degrees from the University of Tulsa and Trinity University and has done graduate work at the University of Oregon, Southern Methodist University, and George Mason University. She has been a Lord Fairfax Community College faculty member since 1971.

At precisely 2:03 p.m., each Tuesday and Thursday, Dr. Zimmerman would stroll into the classroom that was across from his office on the second floor of Kendall Hall. I was one of the sophomore groupies who always came early to claim a seat directly in front of his lectern. No matter what the weather, Dr. Z. always wore tweed, and usually, after a casual, acknowledging nod, he'd light his pipe, open his copy of the anthology, gaze dreamily over our expectant upturned faces at some cloud out the window, and began to recite from the day's assigned poetry. Occasionally, he'd pause to ask a question about the reading, and those of us in the front row would revive from our swoon long enough to stammer out an answer of sorts and underline the passage the question pertained to. The folks in the back, who were staring out the window at the clouds themselves, rarely uttered a peep and seemed to pride themselves on keeping their pages clean. They were the ones who sold their books at the beginning of each new term.

Periodically, Dr. Z. would lecture, and every few weeks, he would arrive with a sheaf of papers in hand. That's when we knew we were going to have a test. Almost always, the test involved recognizing and commenting on quotes or paraphrasing points from the lectures in response to short-answer questions. The A's and B's mostly went to the groupies and the C's and D's to the cloud-watchers. If anyone had asked, the groupies would have revealed that they had read and re-read the assignments and their lecture notes in between classes. The cloud-watchers would have pointed out the inefficiency of reading an assignment on their own, since Dr. Z. himself would read it to them in class. As for lecture notes, few of them bothered to take any.

And that's the way it was in Survey of English Literature. When the term was over, while some of us had enjoyed it more than others, not many of us remembered much of it.

Now, I'm the one behind the lectern, and although I don't wear much tweed and certainly don't smoke a pipe and, alas, don't have any windows in my classroom, I nonetheless spent the early years of my teaching career trying to be a female version of D. Z. Some year ago, however, my college began to invite educational consultants to the campus to talk to the faculty about new methods of teaching. "Lecturing isn't teaching," one of these consultants said. "Try small group work for more class involvement." "Design an open book test," another suggested. "This will de-emphasize memorization and put a greater stress on thinking." Our most recent consultants have shown us how to use writing assignments to help students learn. "Writing isn't just for communication," they say. "Writing can help us understand, and understanding can help us remember."

Gradually, I have changed my teaching methods. When we study poetry, we still read the poems in class, for nothing really can take the place of the sound of a poem. The difference is that my students do most of the reading. If a poem is especially difficult, I may read it to the class, but I've found that students actually enjoy reading poetry—especially if it's assigned ahead of time and they have a chance to practice—how much better it is to have a variety of readers, rather than the same old professor time after time!

My classroom format, however, has changed considerably. At the beginning of each unit, I give out a set of study questions so that students will have them when they read the assignments for the first time. Questions on each work begin with literal inquiries and proceed to interpretive ones designed to lead students to an understanding on their own.

Take D. H. Lawrence's "The Horse Dealer's Daughter," for example. Literal questions that ask for identification of characters, situation and setting will reveal whether students understand that Mabel and her three brothers have fallen on hard times, are having to sell their horse farm, and appear to have only one friend in the world, the town doctor. Interpretive questions will lead to a discussion of such aspects of the story as foreshadowing, establishment of motivation, and use of paradox as an indication of theme. Sample interpretive questions are as follows: What happens early in the story to let us know that something's going to develop between Mabel and the doctor? How is Mabel's suicide attempt believable? How can the doctor be repulsed by and attracted to Mabel at the same time? What are the doctor's reasons for not wanting to be involved with Mabel? How does his attraction to Mabel resemble his desire to practice medicine in that particular location? What are the contradictory fears that beset Mabel at the end of the story? Is this a story "just" about Mabel and the Doctor or is it, at a deeper level, an "anatomy" of an emotion? Explain.

During the class period itself, students are divided into study groups consisting of about four or five individuals each. I number students off so that the groups are slightly different each time. This way everyone in the class gets to know everyone else, and the fact that they're not with the same people each time seems to keep them a bit sharper. Each group is then assigned a set of questions and given five to ten minutes for discussion. One student per group records what is being said and reports on the discussion to the rest of the class. Each student is expected to take a turn at recording and reporting. The questions encourage students to take more responsibility for their own learning and to feel somewhat prepared when they come to class. Previously, students would come to class with a comment such as, "I have no idea what that story was about." Now, because of the questions, they know what to look for. The group discussion gives them a chance to use each other as a sounding board, and it avoids those embarrassing silences that used to occur when I called on students who had "no idea what that story was about."

Fairly often, I provide a mini-lecture in the form of an introduction or a summary. At some point during each class, I ask everyone to write something to hand in, and I use this as a roll-check. It might be a summary of the mini-lecture or of a group discussion. It might be a pre-discussion response to one of the readings, or it might be a role-play. For example, after lecturing on Wordsworth's definition of poetry as "emotion recollected in tranquility," I might ask students to write on "I Wandered Lonely as a Cloud" as an illustration of this definition. I might ask them, after group discussions, to compare Shelley's skylark and Keat's nightingale. Before beginning a group discussion, I might ask them to write a character sketch of either the Duke or the Duchess as portrayed by Browning in "My Last Duchess." In the first semester of the course, I asked them to do the following role-play: "If you are female, which character would you rather go out with—Beowulf or Sir Gawain? Explain." or "If you are male, which character would you choose as a role model—Beowulf or Sir Gawain? Explain."

I always give these writings a brief once-over and then return them with one of the following "grades": a plus-mark (+) means "good"; a check-mark (✓) means "OK"; and a minus-mark (-) means "could be better." I suggest to my students that this in-class writing is a good forecast of how they will do on an essay exam, and this seems to encourage them to give it their best try. Otherwise, they tend not to take the writing seriously. Usually, I write an especially good answer on the board just before class and encourage students to copy it down as I'm giving back the writing from the previous time. At specific points during the term, we see historical background films and, at mid-point, a filmed version of a play and/or a novel. I hand out study questions (both literal and interpretive) on these as well and, again, we use them as a basis for class discussion and in-class writing.

At the beginning of the term, I explain to the students that our class format is designed to help them improve their thinking abilities and to help them learn the assigned material more effectively. I definitely discourage the idea that they can cut class, read at home on their own, borrow notes from a friend, and still do well. Accordingly, at the end of the semester, each student gets a final daily grade that's the equivalent of an exam grade. This daily grade is based on a combination of attendance and the in-class writings. Prior to each exam, we devote a class period to going over a set of review questions, and I assign the study groups at the time I hand out these questions. This gives students a built-in study group for the exam itself. Often I give a two-part exam that consists of a take-home, open-book, open-note essay and an in-class monitored objective or short answer test. Here are some sample take-home essays: (1) Trace the development of English poetic techniques as seen in "Beowulf," "Sir Gawain," "Wife of Bath," "Dr. Faustus," and the short poems of Spencer. (2) Compare and contrast the Romantic writers we studied in terms of the Neo-platonic influences they illustrate. (3) Is Romanticism alive and well among twentieth century poets? Explain, with illustrations.

My goals for the class are no longer simply to dispense information and to use exams to separate those who learned it from those who didn't. My new goals are to have students say, at the end of the term, "(1) The class periods went by a lot faster than I thought they would. (2) I never minded going to class because I knew I wouldn't be put on the spot and that I'd get to talk to a new group of people. (3) I thought this class wouldn't interest me, but the group discussions got me involved in ideas without realizing it. (4) I'm going to use writing more often to help myself think things through. (5) I'm going to use writing more often to help myself learn what I need to know. (6) I think a lot of the stuff we talked about and wrote about in class will probably stay with me. (7) Someday, I'd like to re-read those assignments—and maybe some other things those writers wrote. (8) I made a lot better grade than I ever imagined I would."

Next year, I think I'll do a survey of my students that includes these eight goals. Here, is the survey that I did hand out, along with the results. I'm pleased to note that the responses which were anonymous, were encouraging, as were the students' grades.

(Survey)

TO: The Students in ENG 244 (British Lit. II)
FROM: Prof. Cogan
RE: Experimental Teaching Project

1. Recently, I have been participating, along with a group of other teachers, in an experimental teaching project that is based on these ideas:

   a. Writing can help us understand what we are learning.
   b. Writing can help us remember what we are learning.
   c. Writing can help us improve our thinking (our abilities to reason and discriminate).
   d. If we write regularly and often, we will get better at it.

2. Methods which have been suggested for getting students to understand, remember, and think include the following:

   a. De-emphasize lectures—they encourage students to depend on notetaking and memorization and, thus, to be passive learners rather than active ones.
   b. Use, instead, study groups, study questions, and various assignments that ask the students to find similarities, to find differentiations, to summarize, or to role-play.

3. Since this project is experimental, we can't be sure of the outcome. What we think is a good idea may prove not to be. On the other hand, if it is, then it will make a difference in the way we will teach our classes in the future. We need your help in assessing what has been done so far.

4. Please read the following statements and give them your careful consideration. Remember, we're not interested in what teaching methods you ENJOY the most but in which ones help you to UNDERSTAND, REMEMBER, AND THINK.

5. Give each statement a numerical rating as follows: Strongly Agree - 1; Agree Somewhat - 2; Disagree Somewhat - 3; Strongly Disagree - 4.

6. On the reverse side of the sheet, please comment on the statements. Number your comments to correlate with the statements.

7. This evaluation is to be anonymous. Do NOT sign it.

Survey Statements

1. The film-introductions to the literary periods serve as "mood-setters." Through them, we can get an idea of how the people of a period dressed and wore their hair, how their homes and cities looked, and what their music sounded like. In addition, we can get some idea of what was going on in that period in terms of politics and economics. Because the narrator of the films speaks so fast, however, it is hard to take notes. The study questions help call attention to what's important and make us more attentive. Reviewing them causes a film to stick in our minds a bit more than if we had just watched it passively.

2. Study questions on the literature help us notice the passages most essential to the understanding of a work itself, as well to the most quoted ones from the work. There is a difference between casual, pleasure reading and serious, close reading for study. By doing close reading in class, we can learn to be better readers and this will enhance any pleasure reading done outside the classroom.

3. Study groups create more participation from the class as a whole, rather than having the same few answer each time. This method takes the heat off individuals who feel up-tight about being called on. Through group work, we can get to know others in the class well enough to want to discuss ideas from the assignments outside of class.

4. In-class writings and reviews make us notice the major aspects of the material and give us practice in organizing and expressing our thoughts. Activities like these help us understand the material better, remember it more easily, and thus do better on the exam.

5. Long essay test questions are drawn up in such a way that we can break them down into smaller questions that go together. If we can synthesize information that has been discussed in class separately, we will be more likely to remember it and thus feel we have indeed "learned" it.

Results: Thirty-three students responded to the above statements by marking them as follows: (1) strongly agree; (2) agree somewhat; (3) disagree somewhat; (4) strongly disagree. Totals were as follows:

Question	**Strongly Agree**	**Agree Somewhat**	**Disagree Somewhat**	**Strongly Disagree**
#1	25	6	2	0
#2	19	14	0	0
#3	21	8	4	0
#4	23	9	1	0
#5	17	12	4	0

While the results are favorable, in general, they indicate a need to consider #2 and #5 more carefully.

Here are the anonymous comments the students made about these two questions:

#2 Negative Comments

When the questions are answered in class, students speak too quietly and too fast. It is difficult to keep up and get the correct answers.

I'd like more analytical discussions highlighting the literary techniques used by the authors to emphasize the theme of the work.

Too much time is being taken answering the questions. I think there should be more discussions including the whole class rather than just a series of questions.

The volume of reading coupled with other school and out of school responsibilities make it difficult to devote the necessary amount of time needed to get anything out of the readings. The study questions are too lengthy.

Sometimes close reading ruins my pleasure reading. I become too analytical.

#2 Positive Comments

The study questions are essential if I'm to know what's important.

These questions help to point out the main points of the work. That way we aren't all remembering different things about the work.

Study questions help me to remember and understand what is being asked.

Literature is one of my toughest classes, but the study questions help me to know what to focus on while I am doing the reading.

Study questions make you read into the literature.

It's a good idea to have study questions.

#5 Negative Comments:

Long essays are confusing because I'm not sure exactly what is wanted.

When I write, it's difficult for me to get what I'm thinking onto my paper. By the time I get it down, I think of something else that needs to be in there and it ends up being thrown together, looking like a mass of confusion.

A short answer test would be helpful for those of us who are good at memorizing.

A long essay is OK, providing it is not a question previously given to a study group for discussion during review. This gives an unfair advantage to those groups who did not benefit from working directly on that question.

#5 Positive Comments

I feel a long essay lets you write what you know and you are not penalized for not knowing one certain point. It lets you take the question where you want to.

This type of exam is good to see how much is learned during the semester. Study groups and discussion questions help a lot in preparing for this kind of test.

While it is difficult for some individuals (yes, ME!) to write in a timed group environment, I believe it is the best exercise to prepare me for the business world and does allow me to retain the emphasis of the work a lot longer in my memory.

I think that the long essay was a learning experience. It made me think more on my own, with my own point of views tied in with the basic answers to the question.

I think students get more and remember information more easily if the information is asked for in a longer style essay. Students are also able to discuss their interpretation and views on the work, which I feel is important in literature.

I feel we are more likely to retain the material by writing a long essay.

Essay tests are a true test of whether or not you have absorbed any of the material because they require a great deal of thought. If you have not been attentive in class, the essay will be more difficult; however, if you have paid attention and followed along, you will do well.

Although I don't really enjoy a long essay question, I do have to admit that I learned more.

The test was a little long, but I did remember the material.

CONCLUSIONS

While the above positive comments are gratifying, I am going to give serious attention to the negative ones and will attempt to revise the course for next semester in such a way that these negative comments will be addressed. Comments on the other three questions reflect the numerical ratings and are, with only one or two exceptions, quite positive.

COURSE GRADES - SPRING 1992

Grade	Mid-Term Exam	Final Exam	Daily Average
A	18	27	20
B	9	6	9
C	8	2	4
D	0	0	2
F	0	0	0

Critical Thinking Through Writing in Chemistry

by

Ernest E. Grisdale, II

Instructor in Chemistry

Ernie Grisdale has taught chemistry at Lord Fairfax Community College for 4 years. He has a B. S. from Eastern Michigan University and an M.S. from Georgia Institute of Technology.

This article is the product of a Thinking Through Writing grant conducted from August 1990 to June 1992 at Lord Fairfax Community College (LFCC), Middletown, Virginia. The purpose of the grant was to increase learning and integrate critical thinking through writing in various disciplines. I joined the grant team because as a teacher of chemistry I felt the grant might provide additional opportunities to develop techniques for students to learn and enjoy chemistry and to think critically. I believed finding different approaches to teaching was important since there are an abundance of indicators ranging from studies to personal experiences that show a significant number of students do not enjoy and even fear taking chemistry. Consequently, developing methods that reverse this trend was important if I were going to bring more students into chemistry.

Before discussing how I proceeded with the writing integration process, I believe our college environment should be discussed. LFCC serves a small town/rural population with the largest town being Winchester (approximate population 35,000). The College is situated in the northern end of the Shenandoah Valley and serves seven counties. There are approximately 3,000 students which translates into 1,400 (+) full time equivalent (FTE) students. In general, the chemistry background of most students, attending LFCC is limited to one year. Most high schools in our service area offer only one year of chemistry affording few opportunities for students to take AP or a higher level second year course. In addition, many students upon entering LFCC have not had chemistry for two or more years, because they have taken chemistry as early as their sophomore year in high school or have been out of high school for one or more years.

LFCC currently employs one full-time chemistry instructor and one adjunct instructor. It offers two levels of chemistry: general chemistry, a one year survey course of inorganic, organic, and biochemistry; and college chemistry, a one year college freshman level course. Currently the general chemistry course has the highest enrollment since it meets the science requirements for a wide range two-year degrees. In both cases our enrollment is such that there are not many sections offered per semester of a particular course.

The first year of this project was used to consider and develop writing requirements that I felt could maximize the learning process yet not overburden me with excessive reading to the detriment of other necessary course requirements. A number of different concepts were considered and evaluated. At the beginning of the second year I decided to integrate two processes which had short writing requirements. Both of these requirements were integrated as part of the lecture portion of the course since laboratory reports were written for specified labs.

First, to help the broaden students' perspectives of how chemistry affects their daily lives, I decided that students would read a chemistry related article (Appendix A) once per week. The article had to be at least one page long and could come from any source, e.g., chemistry journals, magazines, newspapers, etc. A short one page or less summary (abstract) of each article was written and turned in for review. Students were given one extra credit point per article.

A second process involved developing a series of short demonstrations which would illustrate a concept or principle discussed in previous lectures since I felt it was extremely important for students to practice observing, analyzing and predicting. These demonstrations were either live or given via a video tape and were presented at the end of class on Fridays. I tried to find demonstrations simple in scope so as not to frustrate students and consequently have them give up without trying. In addition, I continually pointed out that ,in science, for every discovery, there were plenty of "dead ends" that occurred and that they should not be afraid to express their thoughts. The conduct of the demonstrations was as follows. Students were placed in groups of 4-6 and told they could work together to derive an answer to what they observed. At the completion of the demonstrations the students were given 5-10 minutes to discuss their observations with group members. Each student was then asked to write a short (one page or less) description of what occurred based on a simplified scientific method (Appendix B). The paper could be based on whatever was concluded in the group discussions or on their own analyses but each paper had to be an individual effort. The paper was then turned in on the following Friday. Students were given up to two extra credit points per demonstration based on the content of their paper. All extra credit points represented not more than 5 percent of the total points possible in the course.

The two processes just described were integrated into both the general chemistry and college chemistry courses. I used the same demonstrations for both; however, since the demonstrations were developed for inorganic chemistry, all the demonstrations were given in the first semester of the general chemistry course, while they were spread over the entire year of the college chemistry course. As a result the demonstrations were given on a weekly or biweekly basis depending on the course.

Because of the lack of multiple sections of a particular course needed for a complete study, I decided to conduct an informal evaluation of the effectiveness of the two writing processes during the second year of the grant. This evaluation process involved a short questionnaire at the end of the course, comments provided on instructor evaluations and discussions between students and myself. Four sections (two of general chemistry and two of college chemistry) were evaluated with a total of 125 students. The results from the questionnaire were as follows: 75 percent of the students indicated that the demonstrations and writing assignments helped them to better understand chemistry, 77 percent of the students felt that the demonstrations and writing assignments made the course more interesting, 74 percent of the students felt their ability to solve mathematical problems was enhanced to a great extent by the thinking processes involved in their writing assignments, 55 percent indicated that the weekly articles increased their interest in reading more science related articles, and finally 52 percent felt the group sessions helped them to understand chemistry better. These results were amplified by the numerous positive comments both verbally and in instructor evaluations.

As a result of the feedback I received and my own impressions that the students were enjoying the process, I believe that there are indicators for several positive outcomes. First and foremost, the writing requirements appeared to help students analyze and think critically without leaving the students with a negative feeling towards chemistry. Second, the students appeared to enjoy the demonstrations and felt they help them to understand chemistry better. Finally, by giving students a positive feeling towards their chemistry course a more positive attitude should result from the general student population as students converse with each other discussing the pros and cons of courses.

I would like to point out that the additional paperwork I had to review and grade took more time and placed more demands on me as I had expected. The demonstrations did take approximately 15 minutes per week from time available to present material in the lecture, thus requiring me to give less time to selected topics. But I firmly believe that the positive effect from this approach, particularly the weekly demonstrations, more than offset those negative points.

In the future I plan to continue the current methodology developed over the past two years. I will be continually looking for chemistry articles that will be of interest to students and will promote a better understanding of how chemistry affects their lives. These articles will be used to supplement the weekly articles that students select. Also, I will continue to search for demonstrations that are simple and straightforward in scope and that can be used at either level of chemistry. The fact that students must observe, analyze, predict, and then place their thoughts in writing cannot help but promote a long-term benefit to success in school and life.

APPENDIX A

CHEMISTRY READING REQUIREMENTS
(CHM 101/102 AND 111/112)

CHEMISTRY READING REQUIREMENTS

(CHM 101/102 and 111/112)

1. **Students will read one chemistry related article (minimum of one page in length) each week. Articles may be selected from newspapers, magazines, scientific journals, etc. A short summary of each article will be written. Summary should be less than one page.**

2. **On Fridays of the 5th, 10th, and 14th weeks summaries of each article read during the previous five weeks will be turned in. In addition, a xerox copy of each article will be attached.**

3. **One extra credit point will be given for each article turned in. Articles will not be accepted if late.**

EXAMPLE STUDENT ARTICLE SUMMARY

Split Hydrogen Bond Allows Water To Flow

This article is about how hydrogen bonding allows water and other substances to flow easily even with the strong intermolecular bonds which hold them together which would make other molecules stiff.

The hydrogen bonds form a network such as a fisherman's net which makes the hydrogen bonds take a characteristic amount of energy and time to break apart. In most cases the hydrogen is found in clusters of four molecules but every so often a fifth one squeezes in which makes the molecules more crowded which tends to make them more mobile.

In using this theory scientists have concluded that this is the way some molecules which would seem likely to flow slowly would flow freely. Some geologists agree with this theory that the fifth bond between silicon and the neighboring oxygen may explain why the flow of molten rock from volcanos can flow freely down the mountainside.

APPENDIX B

DEMONSTRATION ANALYSIS
(CHM 111/112 AND 101/102)

DEMONSTRATION ANALYSIS

(CHM 111/112 and 101/102)

1. Students observe demonstration and make notes (diagrams if necessary).

2. Discuss observations with other students, if desired.

3. Write an analysis of the demonstration as follows:

   Format:

   A. Observation: Describe exactly what you observed. Use diagrams/pictures as required.

   B. Laws (Chemical Principles): Laws or principles describing observations (i.e., effect of gravity).

   C. Theories (Models): Ideas and concepts explaining observations. (Set of assumptions to explain observed behavior).

   D. Test of Theory: Describe how you might evaluate your theory.

4. Written report must be individual work and will be turned in one week from date of demonstration. Report should not be longer than one page.

5. Report worth 2 points.

SAMPLE DEMONSTRATION

1. Idea: Surface Tension

2. Materials Needed:

   A. A glass, cup, or jar.
   B. Water.
   C. Pennies or some other type of coin.

3. Demonstration:
Place an empty glass on a table in front of the students.
Then pour water into the glass until the class agrees that the glass is completely full of water (Diagram A). Begin to add pennies gently, insuring the edge of each penny enters the water first.

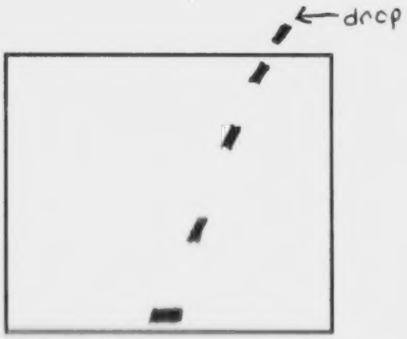


DIAGRAM A

Have students keep track of how many pennies are added before water begins to overflow (Diagram B). At the first sign of water overflowing, stop the experiment and have students discuss their observations within their assigned groups and write a short report following the prescribed format.

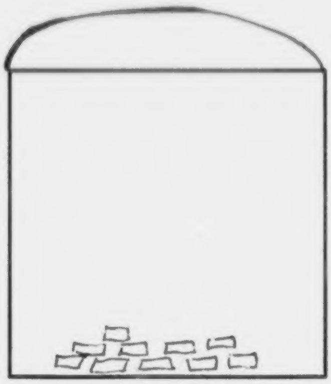


DIAGRAM B

Thinking Through Writing

by

Virginia Hartman

Assistant Professor in Office Systems Technology

Virginia Hartman attained both her B.S. and M. S. in Business from Montana State University and has taught at Lord Fairfax Community College for 2 years.

MAKING CONNECTIONS: A WRITING TO LEARN CURRICULUM MODEL FOR

My original reason for joining the Thinking-Through-Writing Project at Lord Fairfax Community College was to continue the work of transforming Office Systems Technology (OFT) courses from lecture-oriented, read and do, passive learning environments to discussion-centered, real-world, active learning environments. As Zinsser (1988) wrote about writing to learn, "... in writing to learn perhaps the only real ingredients are high enjoyment, zest, and wonder. . . ." I wanted a classroom of active learners filled with "high enjoyment, zest, and wonder." Active learning also requires making connections between course content and real-world experiences of the students. Making connections is the key.

Mortimer Adler (1982) in The Paideia Proposal states that: "All genuine learning is active, not passive. It involves the use of the mind, not just the memory. It is a process of discovery, in which the student is the main agent, not the teacher." As the main agent, the student is required to make connections between the familiar (real-world experiences) and the unfamiliar (new learning). For example, students at Lord Fairfax Community College enroll in Office Systems Technology for very specific reasons. Student surveys conducted on the first day of class usually reveal three primary reasons for taking OFT classes: to gain skills for a better paying job, to meet the technical requirements for advancement and promotion, and to upgrade outdated skills. Community college students are traditionally composed of a multitude of skills, attitudes, motivations, experiences, and ages. On average, OFT students are in their late twenties, female, and focused on gaining employable skills leading toward higher paying, more prestigious positions. Most of these students have one commonality: fear of failure. For many, it has been years since they entered a classroom. Many are filled with self-doubt, recalling earlier high school failures and difficulties. Therefore, the first order of business is to address these real-world experiences. I have found writing activities to be valuable tools for alleviating student fears and anxieties. How? One of the first questions asked of students enrolled in my classes is, "What do you fear most about this class?"

I have found that focused free-writing and journal writing allow students the opportunity to share their fears, develop coping strategies, and begin making connections between what they know and what they don't know and what they want to know more about.

Another driving force for incorporating writing to learn activities in my classes was my desire to revitalize the required "have to" courses. The classroom must become a real-world laboratory of real-world experiences that the OFT graduates will face. Too many times I had observed students completing assignments with passive and marked indifference (until the graded paper was returned). Enough! Armed with the knowledge of one-minute papers, microthemes, journalizing, and a microcosm of assorted writing-to-learn research, I began experimenting with a variety of writing activities throughout the OFT curriculum. These activities included notetaking interspersed with one-minute reaction statements, journal writing, freewriting, microthemes, reports, abstracts, precis and summaries, letters, interviews, proposal writing, class newsletters, and student and peer evaluations. With varying degrees of success--from complete failure to moderate success--what follows is an overview of what I found to be the most successful writing to learn activities based on my observations, student evaluations, attendance patterns, and one-on-one conversations with students.

What I Wanted To Know

At the beginning of the project I chose four areas to study. Specifically, I wanted to find answers to these "what happens when" questions.

1. **What happens when writing is designed to teach?** Will writing facilitate learning of content in courses requiring employable technical skills?

2. **What happens when writing is designed to explore?** Will writing entice students to consider the "what ifs," to transfer content knowledge and skills to a variety of business applications, and to examine the possibilities?

3. **What happens when writing is designed to challenge?** Will writing encourage students to become active learners in the classroom?

4. **What happens when writing is designed to extrapolate?** Will the use of "Minute Papers" (Cross and Angelo, 1988), and "Microthemes" (Bean and Drenk and Lee, 1982) invite higher level thinking skills?

What I Found Out

I did not consciously develop writing activities that would build progressively into higher levels of learning. However, midway through the project, it became apparent that the writing to learn activities were building on previous writing skills and in the process were incorporating higher level learning skills. Individual writing activities were designed to allow students to internalize learning and to make connections between what they did know and what they did not know. Students were encouraged to sort and categorize and look for similarities between the real world and the classroom. Collaborative writing activities tended to stretch beyond the classroom, encompassing the college community, the business community, and the general public. Many of the collaborative activities encouraged students to analyze, compare, create, and debate real-world issues.

By the end of the two-year project, a Thinking-Through-Writing Curriculum Model for Office Systems Technology had evolved. The curriculum model represented four levels of writing to learn activities: the closed environment, the contained environment, the shared environment, and the global environment. The levels were representative of real-world writing activities that OFT graduates would expect to find in business and industry.

The Office Systems Technology Writing to Learn Curriculum Model:

LEVEL 1: Closed Environment. Writing for self.

Writing activities: notetaking, journalizing, freewriting, summarizing, "how to" guides, to do lists, schedules, and calendars.

Business focus: personal writing for successful job performance, memory aids, learning strategies, organizing and managing information, knowledge and skill based.

LEVEL 2: Contained Environment. Writing for instructor and classmates. (internal single-purpose audience)

Writing activities: one-minute papers, memos, informal minutes of group meetings, agendas, general and technical reports, microthemes, summaries, and evaluation forms.

Business focus: writing for supervisors and co-workers within a department, knowledge and information based, to inform and persuade.

LEVEL 3: Shared Environment. Writing for college-wide audience. (internal extended audience)

Writing activities: reports, proposals, memos, training materials, precis and summaries, interviews, abstracts, and evaluations of products or services.

Business focus: company-wide communications across all departments and business functions, information seeking and reporting.

LEVEL 4: Global Environment. Writing for public audiences. (external multi-purpose audience)

Writing activities: questionnaires, newspaper articles, letters to the editor, sales brochures, summaries, interviews, newsletters, and general purpose reports.

Business focus: writing for general audiences, letters to customers and clients, newsletters, sales brochures, general information and service oriented.

Writing to Learn Activities

Described next are four writing to learn activities that encouraged students to look for and find connections between the real world and the OFT classroom. They are the learning log portfolio, the proposal, the one-page newsletter, and the questionnaire.

The Learning Log Portfolio (LLP):

The Learning Log Portfolio, a combination learning log and portfolio of completed assignments, proved to be a valuable aid for students returning to the classroom after many years' absence. This LLP allowed students to organize and sort information, to reflect on what they were learning, and to find out what they did know and what they did not know and what they wanted to learn more about. Because students enrolled in OFT programs expect to find meaningful employment upon graduation, I felt one way of encouraging them to take charge of their learning was to make coursework more career focused. By requiring a portfolio of assignments completed throughout the semester, students could start building an employment file to share with prospective employers, demonstrating skill levels and competencies. I also wanted students to document the process of writing and learning. Therefore, students kept a journal (learning log) revealing personal feelings, reactions, and attitudes about the skills and knowledge gained. The learning log component would allow a play-by-play review of the skills gained and the strategies used to gain control of the knowledge necessary for successful completion of the course, while gaining the skills necessary for successful employment.

The Learning Log Portfolio was used extensively in two classes: Word Processing I and Desktop Publishing I. Students maintained a three-ring notebook with four dividers. The four dividers were labeled "Learning Log," "Work Completed," "Article Abstracts," and "Real-World Examples."

1. Learning Log. Students were asked to write journal entries (usually the last five minutes of class) addressing the AHAs! (what they had learned of importance that class meeting), the HUHs? (questions or concerns they still had), and the WHYS? (relating the classroom learning to the real world.) Students were allowed approximately one minute per item. Students were asked to sign off each journal entry with a one-word description that reflected their feelings and reactions to the discussion or skill application, followed by the date and time.

Comment: As suggested in my reading of Thinking-Through-Writing activities, I would open the next class session with what students found to be the most significant learning from the previous class. This was a useful bridge from one class meeting to the next, particularly with evening classes which meet once a week. I could also clarify any areas students had identified as confusing with either discussion or hands-on activities centered around a particularly troublesome concept.

2. Portfolio of Work Completed. Students were asked to keep representative samples of completed work representing competencies learned during the course. These were announced at the beginning of the semester with due dates. Students were also asked to write a one-minute paragraph identifying the real-world skills learned after completing the work. Students were told that they were developing an employment portfolio that could be useful during job interviews after graduation.

3. Article Abstracts. Students were requested to summarize four journal articles relating to the content area. A photocopy of the journal article was also requested. This assignment was a summary-writing microtheme, summarizing and analyzing the author's point of view and limited to one single-spaced page. One variation of the microtheme that I used was to require students to record positive or negative reactions to the author's writing style and point of view. Periodicals to be used by students were assigned--WORD PERFECT for the Word Processing class and PUBLISH for the Desktop Publishing class. The reason for this specificity was that students could immediately find articles containing information relevant to class content, such as productivity tips (shortcuts), uses of software applications, career information, and new trends in equipment and software.

4. Real World Examples of Course Content. Students were asked to find real-world samples of concepts/applications learned in class, such as the use of tabs and columns in advertising flyers, consumer reports about the software/equipment used in class, examples of type/design/layout, well-designed letters and memos, and business-oriented printed materials that "captured attention." Students were also asked to write a one-minute paragraph analyzing the connection between the "real-world example" and course content.

Throughout the project, students were asked periodically for their perceptions of the effectiveness of the LLP. The general student consensus of this writing component was: "It was a lot of work during the semester; however, by the end of the semester I felt a sense of accomplishment and pride."

Student Comments - Learning Log Portfolio:

> *The Learning Log Portfolio concept is a great way to evaluate yourself as you're progressing through a course. It is such a sense of accomplishment at the end of the course--to see all that you have learned.*
>
> *The Learning Log Portfolio was a good way to keep my work organized and to gauge the progress I was making in the course. When the course was finished, it became even more meaningful as it helped me realize the amount and type of work that was accomplished during the semester.*
>
> *The abstracts--although sometimes bothersome--are a good way of getting us to read periodicals that we usually aren't exposed to.*
>
> *Continue to require outside reading. It really expands your mind when you see the software shortcuts available and what people are doing with the software (other uses and applications of what we are learning in class).*
>
> *Keeping journals and being aware of different developments in the area of desktop publishing is useful.*

The Proposal:

Students enrolled in Keyboarding I independently researched four different brands of electronic typewriters and dedicated word processors. A record was kept of which retailers and suppliers students had visited so that duplication could be avoided. An evaluation sheet was developed by the students and used to compare equipment researched. Students were then grouped to collectively write a three-page (maximum) position paper (a type of microtheme) recommending one electronic typewriter or dedicated word processor for home use (and why) and one electronic typewriter or dedicated word processor for office use (and why). The majority in each group had to agree on the selection. Students were then regrouped and asked to write a proposal directed to the Dean of Instruction requesting purchase of dedicated word processors for classroom use, complete with specs and justification. The Dean of Instruction reviewed the proposals, and via the instructor, the groups received feedback.

Periodic student evaluations revealed that about 80 percent of those participating felt this writing activity was a valuable component to the keyboarding class. Many indicated that they were thinking of purchasing a computer or an electronic typewriter (ET) and had been putting off a decision because they did not know what questions to ask to make a reasoned decision. Many students indicated they had never heard of dedicated word processors before this writing assignment, and they were amazed at the similarity to computerized word processing applications, at a significantly lower cost.

Student Comments - Proposal Writing:

Most of the student comments on periodic written evaluations and through class discussions indicated they did see value and relevance in this writing assignment.

> *I know much more about which electronic typewriters are worth the dollars.*
>
> *I know what to look for when purchasing electronic typewriters.*
>
> *I know the terminology now and feel okay about talking with salespeople about electronic typewriters and dedicated word processors.*
>
> *Knowing the terminology has helped me work with our ETs in class.*

The One-Page Newsletter:

Students enrolled in the OFT Proofreading and Editing class developed a one-page flyer (newspaper format) covering one topic about proofreading and editing. The intended audience of this newsletter was the administrative support staff at the college. First, students selected the proofreading/ editing topic they wanted to learn more about. After the independent student research was completed, the students were grouped and asked to create an in-house newsletter which would be "mailed" to all administrative support staff at the college. Peer review was used extensively for this project. After the students had roughed out the text to be used in the newsletter they were asked to locate graphics (relating to the topic) which could be included in the newsletter.

After written evaluations at the end of the semester, seventy-five percent of the students enrolled in the classes believed that the writing exercise helped them learn course content and gain employable skills.

Student Comments - One-Page Newsletter:

> *Allowed me to use the skills learned in class.*
>
> *Trying to hone and whittle down the information into a one-page format was extremely difficult.*
>
> *I learned how to convey the message more clearly and concisely because of the one-page requirement.*
>
> *Learned more about proofreading...tips I placed in my flyer will stick with me.*
>
> *It was fun to be creative...stretching my imagination to come up with a graphic that would represent the grammar tip sheet.*
>
> *Made content of course relevant.*
>
> *I still hate writing. . .*

Well, you can't win them all.

The Questionnaire:

Students enrolled in Keyboarding II individually researched current office correspondence formats, including letters, memos, reports, and specialized forms. Then in small assigned groups, students created a questionnaire based on their research and a cover letter explaining the purpose of the classroom research. One group designed the letter section of the questionnaire; another group, the memo section; yet another, the report section; and finally, another group designed the specialized forms section. Students then targeted 25 businesses in the LFCC service region to complete the questionnaire. Questionnaires were mailed to the targeted businesses, and results of returned surveys were tabulated. Using the tabulated raw data, students met in small groups to translate findings into interesting prose (report style) for a general audience. This report was presented to classmates. Peer evaluations were used to critique the informational reports. After all the suggested revisions were completed, the final report of findings was mailed to all survey participants.

Through a final evaluation (after all grades had been reported), sixty percent of the students enrolled in the class felt the writing activity helped them not only to learn course content but also to understand the importance of accuracy in interpreting, evaluating, and reporting raw data findings.

Student Comments - Questionnaire:

> *Learned different formats used by businesses and how they differed from the formats in he typing textbook.*
>
> *Liked working in a group to develop the questionnaire.*
>
> *Very hard work to communicate and meet deadlines working with a group. Would prefer his be an independent project.*
>
> *Liked working on and creating the questionnaire. It is hard to make sure that what you are asking is clear and not easily misinterpreted by the people completing the surveys. The group helped with this problem.*
>
> *We didn't get as many surveys returned from businesses as we expected. That was really disappointing because our group worked so hard on developing our part of the questionnaire.*

In Summary

Although the Thinking-Through-Writing Curriculum Model is not finished and needs refinement, it is possible to react positively to the writing to learn activities included in the model. Attendance improved, lively class discussions were the norm, and the real-world writing activities challenged all of us to look for connections in our everyday lives.

During the next two years I will conduct a more formal evaluation of writing to learn activities. My goal is to collect and analyze student writing at all levels of the curriculum model. An attempt will be made to identify categories and similarities of process and success factors contributing to active learning. Other formal evaluation data will include comparison of grades, drop out rates (retention), ability to find employment upon graduation, evaluations from employers, and surveys of graduates of the program. Finally, two or three students will be identified to participate in a case study analysis of the writing to learn activities. This should allow further refinement of the OFT Curriculum Model.

This has been a satisfying project. Students have reacted positively about changes in and new directions for OFT classes. As for me, I find each day a new adventure. Any instructor who uses writing to learn activities in the classroom will be refreshed, rejuvenated, and ready to begin each class with "enjoyment, zest, and wonder."

APPENDIX A

PRE-COURSE QUESTIONNAIRE WRITING TO LEARN

CREATIVE/CRITICAL THINKING ABOUT SUBJECT CONTENT
PRE-COURSE QUESTIONS

Name (optional)________________________________ Class__________________

A writing component has been added to this course by the instructor. Many authorities on learning believe and advocate that the ability to put thoughts, ideas, etc., on paper (writing to learn) enhances and improves the student's ability to learn and understand material.

As a result, this instructor is involved with a "Writing to Learn" project and has incorporated writing as a component of this course. You will have an opportunity to perform a variety of writing activities including learning logs, research activities, group collaborative activities, and independent projects.

1. Do you enjoy writing? Why or why not?

2. How well do you think you express yourself in writing? Select one and explain.
   a. very well Why?
   b. well
   c. fair
   d. poorly

3. What do you fear most about this course? Why?

4. How often do you read articles or books related to this subject?

5. Which journals or newspapers do you read?

6. Do you question the content/viewpoint/accuracy of articles you read?

   a. always b. sometimes c. never

7. Are you hesitant to join class discussions or to ask questions in class? Why/why not?

8. How do you learn new things best? Explain.

APPENDIX B

POST-COURSE QUESTIONNAIRE WRITING TO LEARN

CREATIVE/CRITICAL THINKING ABOUT SUBJECT CONTENT
POST-COURSE QUESTIONS

During this semester, you have been involved in a "Writing to Learn" project. Many authorities believe and advocate that the ability to put thoughts, ideas, etc., on paper (writing to learn) enhances and improves the student's ability to learn and understand material.

Please evaluate the "Writing to Learn" activities that were incorporated as a component of this course. You have had an opportunity to perform a variety of writing activities including learning logs, freewriting, microthemes, individual and group collaborative activities, and research activities.

1. Which writing to learn activities were most helpful to you in learning the content of the course? Why?

2. What suggestions do you have to improve the quality of the writing to learn activities you mentioned above?

3. Do you think you express yourself in writing better now than at the beginning of the class? Why or why not?

4. What do you remember that you feared most about this course at the beginning of the semester? How did you "work through" these fears?

5. What is the most significant change in your reading patterns since the beginning of the semester?

6. What is the most significant change in your class participation habits since the beginning of the semester?

7. Identify two things you learned in this course. Did the writing to learn activities help in any way? Why or why not?

APPENDIX C

STUDENT ASSESSMENT: VALUE OF WRITING COMPONENT

WRITING TO LEARN
CREATIVE/CRITICAL THINKING ABOUT SUBJECT CONTENT
PERCEPTION OF VALUE OF WRITING ACTIVITIES

Please complete this confidential survey.

1. Please use a positive adjective to describe the writing component of this class?

2. Please use a negative adjective to describe the writing component of this class?

3. Which writing activity did you like best or find to be most valuable in learning content?

4. Which writing activity did you like least or find to be least valuable in learning content?

5. What did you learn or gain by participating in the Writing to Learn project?

6. How would you rate the writing activities included in this class? Explain.

______ A good learning tool   _____ Not of value

7. What would you change about the writing activities included in this class?

APPENDIX D

OTHER WRITING TO LEARN ACTIVITIES IN OFFICE SYSTEMS TECHNOLOGY COURSES

OTHER WRITING TO LEARN ACTIVITIES

Listed below are other writing to learn activities that were included in OFT courses throughout the two-year Writing to Learn Project. This list is intended as an overview of work in progress only and is made available to assist others in creating writing to learn activities within the OFT curriculum.

Word Processing class:

Interview an office professional currently using a word processing software program, looking for positive and negative aspects of that specific application program. (Independent activity) Then, within an assigned group of students in the class, compare findings. Together, formulate and present to the class a "This we believe about word processing software. . ." (Collaborative)

Desktop Publishing class:

Research (Independent - assigned) several current desktop publishing software programs, such as Ventura Publishing, PageMaker Publishing, Quark Publishing, Ready-Set-Go Publishing, GEM Publishing, etc., and in report format (Collaborative - assigned) compare/contrast major features, costs, uses, and equipment requirements. Finally, using computerized graphics or poster board, develop a graph/pictorial format to categorize/rank the software by cost, use, and features.

Proofreading and Editing class:

Maintain an "Excellence in Writing" notebook. Look for and collect samples of good writing from a variety of fields/disciplines (science, math, technology, literature, etc,) and based upon classroom discussion and research explain why the writing is considered exemplary. (Individual microtheme)

Look for and collect poor proofreading/editing examples (one a week) from a variety of sources (textbooks, magazines, newspapers, flyers, brochures, etc.) and for each sample identify the error and submit a recommendation for corrections (citation included). (Individual microtheme)

Keyboarding I and II classes:

Compose technical reports based on raw data computer printouts provided by the instructor. Note: The colleges administrative departments have an abundance of non-confidential computer printouts which can be used for this purpose. (Independent activity and collaborative activity)

Compose general interest (interesting prose) reports based on technical reports. (Independent activity and collaborative activity)

"I Was Forced To Think"

by

Anne L. Legge

Associate Professor of English

For twenty years, Anne Legge has taught courses at Lord Fairfax in composition, business writing, American literature, and mass media. She has a B.A. from William and Mary and an M.A. from the University of Virginia.

"I WAS FORCED TO THINK."

— anonymous student comment

True or False: Stephen Crane never saw a battle before he wrote THE RED BADGE OF COURAGE.

Multiple Choice: In OF MICE AND MEN, Lenny and George were
(a) cousins, (b) friends, (c) brothers.

Short Answer: What state is associated with John Steinbeck?

For years I opened my community college Survey of American literature class with a quiz composed of such questions based on the current reading assignment. I used the quizzes to prompt students to read the assignment prior to class. But I was never comfortable about the kind of information elicited by the quizzes and the message conveyed by this emphasis on trivia, and I thought hard about what I really did want students to take away from the survey course. Of course, they need to remember some specific facts, but these individual threads and slubs of information should be woven into a whole and meaningful fabric. Another thing that bothered me was the passive role of the students. They didn't DO anything with these bits and pieces of information except to memorize them — I wanted them to scrutinize the fragments, to hold them to the light, to compare them and find relationships, to try them on, react to them, and evaluate them. Furthermore, I felt I was under-utilizing the experience that my students bring with them to class. The average age in these community college night classes is around 35, and I thought of the untapped resources sitting there in my classroom drowsy and dormant!

As a result of participation in the Thinking-Through-Writing grant program, I decided to experiment with a different strategy in my two American literature classes. Each of these classes met one evening a week for three hours, with 30 students in one section and 32 in the other. I wanted to try using informal "think writing" assignments instead of the trivia quizzes. I added two journal entries per week to the syllabus, specifying that the entries should be about a page long and that they should be written before coming to class so that we could make use of them in class activities. In order to do the journals, students had to read the assignments carefully and thoughtfully.

In class, I often asked students to read from their journals as a take-off point for class discussion. Sometimes they worked in small groups, reading their writings to each other and pooling them in a report to the class. At the end of each class, I collected the entries and took them home. I read them and wrote responses on them as thoroughly as time permitted, always addressing the content of the writing. I emphasized to the students that these were to be informal, raw "think-writings," and I never marked editing errors in spelling, mechanics, or grammar. I checked the entries off in my gradebook and gave credit for them, but I did not grade them.

Here are some examples of the weekly journal assignments:

(1) Is Puritanism strictly (no pun intended) a seventeenth century phenomenon or is it alive and well today? How? Where?

(2) In what ways can Poe be described as a Romantic?

(3) Copy and discuss a passage from WALDEN that touched you personally.

(4) After reading "The Love Song of J. Alfred Prufrock," freewrite for about a page.

(5) How do Eliot and Pound portray the modern world? Is it a nice place to live or even to visit? Point to some specific lines that back up your assessment.

(6) Based on the poems you read, what are the hallmarks of a Frost poem? What characteristic forms, subjects, techniques, and themes would help you to identify a poem as his work?

(7) What is your favorite Frost poem and why do you like it?

(8) Compare and contrast the poetry of W. C. Williams with that of Cummings. What influence do you think Williams' profession had on his work?

(9) (To be done after viewing film on Steinbeck) You are an Okie who has lost the family farm, and you and your family, with all your worldly goods tied onto a Model A Ford, are heading for California hoping to find work and a new life. You have stopped for the night. Write an entry in your journal.

(10) After reading the handout on Existentialism, freewrite about it. If there are parts that you don't understand, you are not alone! Try writing about what you DON'T understand.

(11) The work of Baldwin and Brooks focuses on the black urban scene. What problems do they present? What solutions, if any, do they suggest? Does this material help you to understand current racial tensions in American cities.

Here are some excerpts from student journal entries, written in response to some of the questions listed above:

An 18-year-old responds to question 2 (above): "In what ways may Poe be described as a Romantic?" The student's consideration of the question prompts him to speculate about the motives behind the characteristic subject matter and structure of Poe's stories:

Poe seems to be not necessarily illogical, but definitely a little, well, very strange. His life and the manner he lived seemed very depressive. I think this drove him to write "illogically" sad or even fearful writings. He seemed to write to relieve his feelings and enjoy death as with romantics—they build ruins in gardens...And, still yet illogical is not really even a proper description—he did develop detective stories. He got the idea to get the ending first and develop the plot around it...Poe is definitely very exciting to read and very enjoyable.

Here is an adult student hesitantly writing her way to a fairly sophisticated understanding of Eliot's challenging poem. "The Love Song of J. Alfred Prufrock" (question 4):

I don't understand what the yellow smoke is. The sixth stanza, I think, it is talking about how he will dress or look going to see his sweetheart or some lady. He talks about the lady's eyes, arms, and perfume. He is trying to tell her something important. What—I don't know—maybe to ask her to marry him. He is too scared to, and I don't think he does. He mentions something about only being an attendant lord so maybe he doesn't think he is good enough...I think the mermaids have something to do with this (maybe symbolism somehow), but I can't understand what. Maybe since they are not real, maybe he thinks the love between him and the lady is not real...

In the next entry, a student tackles an affective writing assignment which calls for role-playing based on reading an excerpt from THE GRAPES OF WRATH (question 9):

Today the baby's fever raged on. I am scared for her life. If she dies, we'll have to bury her here in the middle of nowhere with nothing but sticks and rocks to mark her grave. I cannot understand why a loving God would give me a good man, good home, beautiful children and threaten to take it all away...

Another student catches Steinbeck's style in some dialect (question 9):

Midnight—Pa and I have just said our goodnights and the chillens they lie asleep, best they can with the desert cold night and Sarah's cough. Poor thing! It aint give her no rest since we been on this *journey and my heart aches so's I gives her my coat to keep the chill off and sit here under the moon praying and writing and worrying...*

A student writer creates a setting and uses it to set the mood in a manner reminiscent of Steinbeck himself (question 9):

Today the family and I walked the same road that we walked yesterday, moving one foot after another while the dry, sinister trees looked on and the dust from the road choked my lungs. Once a bus came along, filled with people, and going in the direction we were headed, but they would make no room for us but keep right on moving, kicking up more dust in our faces...

In the following entry, a student grapples with the concepts of existentialism and articulates a critique of contemporary American ethics (question 10):

Existentialism is supposed to be present in twentieth century thought, but the thought is not carried through in action. Existentialism is total honesty, such as, seeing clearly with the ability to set goals, and to make the proper choices in living, with the ability to accept the consequences that prevail. Most Americans can set goals, and make choices in living, but they have difficulty in the honesty department...

These student responses show evidence of careful, thoughtful reading and of several different kinds of critical thinking in progress, including application, analysis based on evidence and inference, drawing conclusions, synthesis, comparison, and evaluation. The entries also show students imaginatively projecting themselves into the literature and relating it to their own experiences.

I was excited about the thoughts and feelings expressed by my students in their journal entries, but I wanted to find out how the students themselves felt about this Thinking-Through-Writing instructional strategy. Accordingly, at the end of the fall semester, I surveyed both classes using an instrument which asked for narrative comments. Then, at the end of the spring semester, I used a survey instrument which called for the same sort of information in a form which could be tabulated, as well as providing space for comments.

Of the students surveyed, 100 percent said that the weekly journal entries encouraged them to read the assignment before class. They also said the journal made them read more carefully:

It made me read the material and think about what I read.

I tend to procrastinate but writing the journal helped me to find the time to do the reading as well as helped me organize my thoughts later.

The journal entries forced you to really think about what you read and often to go back and reread some parts for a better understanding—in order to write about it.

The entries do help to let us know what we should be getting out of the writings and discussions.

The student survey also revealed that 98 percent said the journals encouraged them to think critically about the writing assignment. The survey instrument defined "critical thinking" as "thinking analytically, making connections, noting differences, and making judgements."

I sometimes get rushed and read sloppily. The journals served as a safeguard against this—I knew I would need to have thought about more than who was named what.

I was forced to think.

In understanding the literature, one needs to read and reread and concentrate. Therefore, the necessity of doing the journal entries forces one into analyzing.

I even read over my journal entries several weeks later and come up with new ideas each time. Writing is a mind exercise.

The survey also revealed that 92.5 percent said the journals helped them to relate personally to the literature:

Journals make you think about the ways in which the work related to your own ideas and life.

With journal entries I am able to remember how I felt which helps me remember the facts.

Of the students surveyed 95 percent said the journal entries enhanced their participation in class discussion, and some observed that the class discussion in turn reinforced the journal writing:

Hearing the views of others is helpful and interesting. The journal entries helped us to be prepared for class discussion.

I felt better prepared to participate in class discussions as a result of the journal pages.

The weekly J.E.'s (journal entries) were given thought while writing, then the class discussion brought out things missed or ideas not recognized.

After the journal entries the class discussion let you know if you had the right thinking.

For the mid-term and final examinations in the American literature survey courses, I assigned comprehensive take-home essay questions, hoping that these would build on the thinking elicited in the journal entries and class discussions. Here are some examples of the examination questions:

(1) The following essay question covered half of the first semester and incorporated content from a number of journal assignments:

This is the scenario: You are working as a volunteer to help organize the holdings of the Library of Congress. In the depths of a dusty cupboard, you find three manuscripts. After you have read the manuscripts, you are able to reach the following conclusions, based on the forms, objects, themes, and styles of the documents:

Manuscript #1 is from the Puritan period, the work of Jonathan Edwards.

Manuscript #2 is from the 18th century, the work of Benjamin Franklin.

Manuscript #3 is from the Romantic period, the work of Edgar Allan Poe.

Explain the thinking by which you reached these conclusions, citing specific examples whenever you can.

(2) Here is a shorter essay which draws from the journal entries based on the 19th century Romantics:

We have studied six great American Romantics—Poe, Hawthorne, Emerson, Thoreau, Melville, and Whitman. In your opinion, which one of them epitomizes American Romanticism? Explain, citing examples from the work of the writer.

(3) The following essay deals with existentialism and focuses on selected 20th century writers:

Write a 2-3 page essay in which you explain existentialism and show how it is reflected in the work of Fitzgerald, Hemingway, Williams, and Cummings.

(4) The following question calls for a 3-4 page essay which draws from journal entries such as the one on Pound and Eliot:

What portrait of the modern world emerges from the contemporary writers we have studied? What do they suggest or imply about how people can survive in such an environment? Give specific examples whenever you can.

I used my surveys to ask students how they felt about the essay examinations. In answer, 97 percent said the comprehensive take-home essay examinations encouraged critical thinking. Here is a sampling of their comments:

On an essay one must think and rethink the material which tends to make people remember or learn it.

You can memorize for objective (tests) but must have understanding to answer essay (tests).

Essays make me search and explain.

I learned more than what I already knew from the class when given time to research more deeply.

A number of students mentioned feeling more comfortable and less stressed with journals rather than quizzes and with take-home essays rather than tests written in class:

Quizzes promote stress and added pressure.

When on a time limit I tend to panic and go blank.

Journal entries do not put the pressure on to be 'right' about something and let the reader think more on his own.

As an instructor, I have been pleased and excited about the results of using Thinking-Through-Writing in my college American literature classes. The journal entries clearly encouraged students to read their assignment before class and to think critically about the material. Students tended to talk about their own experience both in the journal entries and in the class discussion. The journals fed the class discussion, which in turn helped to prepare students for the comprehensive essay examinations. The course content "felt" more unified and coordinated than it had before, and there was a gratifying amount of cross-referencing between writers, works, and period introductions. One student put it this way: "The journal entries really helped with the reading. The essay tests seemed to finalize the readings and journal entries."

This project has made my teaching more exciting and more satisfying because of the new insights that emerged in the journals, discussions, and essays. I never know what will crop up, and I love that! I definitely do not want my lecture material to come back to me verbatim on the exams. What I want is evidence that the students have read the literature carefully and thought critically about every aspect of the course: reading, audiovisuals, lectures, discussion, and journal and essay writing assignments.

There is certainly room for refinement and improvement of these Thinking-Through-Writing strategies. Some of my journal topics are too general and need to be sharpened and focused. I want to work harder on my written responses in the student journals. Class discussion would be improved by some attention to communication skills—for example, questioning, listening, and summarizing skills. I need to work on my own questioning techniques to refine the class discussion because I think my students are capable of deeper insights and can become more articulate in explaining and defending their ideas.

A number of students complained that the work load of reading and writing was too heavy, and I am going to think carefully about that suggestion. Since I am asking for a higher quality of thinking, it may well be that I need to cut down on the quantity of reading and writing that I require.

As the year progressed, I felt that the classes had developed an atmosphere that was highly conducive to the free expression and exploration of ideas. Most students seemed to feel comfortable speaking up to ask questions and make comments, to say what they liked and what they did not. One student comment described our classroom as "a comfortable yet challenging atmosphere for growth." I attribute this ambiance partly to the establishment of a dialogue that went on as I wrote comments in the journals, as we talked and listened to each other in class, and as the students "talked" to me on their essay exams and I replied with comments and questions. A student commented that she liked the fact that I would sometimes say, "That's a point I had not considered before—that's a very interesting observation." Rather than my being in the position of an authority lecturing from the podium to subordinates, we had become a group of peers working together to explore the rich and wonderful fabric of American literature.

HLT 116 Personal Wellness Classes

By
Walter K. Malinowski, Jr.
Assistant Professor of Health, Physical Education, and Recreation

Walt Malinowski has taught at Lord Fairfax Community College since 1970. He has an A.A. from Miami-Dade Junior College, a B. S. from Florida State University, and an M. A. Ed. from Eastern Kentucky University.

During the first fifteen years at Lord Fairfax Community College (LFCC) my primary teaching responsibilities had been in the area of physical education activity classes, but during the last five years because of increased enrollment and more interest in health and wellness, I have been teaching more classes in the health areas.

Most of our students must take a health or physical education class to fulfill their degree or certificate requirements. The average age of our students is 28 and most of them are employed and have families. The majority of our students (62%) are female; many are single parents. They are individuals for whom a wellness course would have a great deal of relevance.

I have always felt that wellness should be taught, and have tried to include it in my activity classes whenever possible. Then a little over a year ago I was given the opportunity to teach HLT 116: Personal Wellness. It has since become my most popular class with a spring enrollment of forty students.

When the Thinking-Through-Writing grant became available I thought it would be a good opportunity for me to learn how to incorporate writing in my classes. I felt that our students needed to write more, and I wanted to find ways to use writing in my HLT 116 classes. I noticed that when questions were asked in class the same students always answered, but I wanted everyone to participate and thought, that through writing, they all would have to participate.

I also wanted to create an environment in which writing was encouraged without the pressure of it always being graded for grammar, punctuation, spelling, and content. Finally, I wanted them to write about what they were learning and how they were going to use this learning in their lives.

In order to accomplish the objective of applying critical thinking through writing in my HLT 116 classes, I required the students to complete the following four-part writing assignment:

(1) Complete a nutritional analysis of their present diet. (Appendix A)

(2) Complete a Readiness Questionnaire before participating in any physical activity. (Appendix B)

(3) Complete a physical fitness test and analyze the results. (Appendix C)

(4) Write, revise, and submit a 2-3 typewritten page, double-spaced paper entitled, "My Personal Wellness Plan."

The first three parts plus two rough drafts of their wellness plans were graded using a point system based, simply on satisfactory completion and turned in by the due dates. Only the last typed personal wellness paper was graded on punctuation, grammar, spelling, and content.

Satisfactory completion of these writing objectives resulted in a possible 100 points which counted approximately 30% of their final grades. The nutritional analysis was worth 20 points. The first analysis was worth 10 points. The two rough drafts of the personal wellness plans were worth 10 points each, and the final typed revision was worth 50 points.

When they had completed their final typed wellness plan, I had them place it in a two-pocket folder with the two rough drafts in one pocket, and their diet, fitness questionnaire, fitness analysis, and any extra credit they did in the other pocket. Extra credit could only be earned by doing a written assignment approved by me. (Appendix D)

When the year was over, I looked over their papers to determine what conclusions could be draw. Did the extra writing help them learn? The following are responses to question #10 on the post-course questionnaire which asked students what they had learned from this writing experience:

Everytime I did a draft, it got better.

While writing my drafts I didn't think I had learned anything, but reading over them now I see what I learned a lot, and had made some really good changes.

I learned just how important personal wellness is in my life.

I learned about the different aspects of wellness, my strengths, my weaknesses, and what I have to do to improve.

I learned to re-evaluate old knowledge about health and apply new knowledge to everyday living.

I learned that your perspective changes as you gain more information.

I have learned through each paper that I have improved wellness in some way.

The drafts progressed as the class progressed. I was able to expand on the ways to improve.

A lot of writing was required to complete this objective satisfactorily which hopefully meant that they had to be thinking and actively involved in their learning. One of the first things I had done was an assessment of how the students felt about writing. I gave a survey during the 1992 spring semester which produced some interesting results:

1st. The classes were 73 percent female.
2nd. Most, 66 percent, of the students liked to write;
3rd. Most of the males, 56 percent, said they didn't enjoy writing; and
4th. Only 25 percent of the females said they didn't enjoy writing;

The survey indicated that the females in the class probably had less resistance to the activities than the males and that I might have to do some extra motivational salesmanship with the males, especially if the compostition of the class ever changed.

I was very pleased with the results of the students' wellness plans and believe it was a very effective learning experience. Let me give you just one example of a student's work.

Mary (not her real name) is a 42 year-old mother who took this class in the fall of 1991. She did not enjoy writing but was "going to try hard to be a good learner." In Mary's first draft she was very tentative, it was only two pages long and she had only the following to say about her diet and exercise:

(1) Not eating three meals a day;
(2) Junk food eater; and
(3) Have no exercise plan.

Five weeks later Mary's second draft had grown to four handwritten pages, and she was able to write the following:

(1) This class has taught me that aerobic exercises must be performed in order for the exercise to give me cardiorespiratory endurance and to do my body good.

(2) I know some foods were not good for people with heart trouble...but I figured that if a person eats and stays well they could just keep eating that way.

(3) When I am in the grocery store, my mind thinks of the labels I need to read to see especially the amount of fat that is in the product.

Mary had then begun to think about what was good for her and to take some action.

By the end of the semester Mary's final wellness program consisted of six typed pages. She was more positive and knowledgeable as shown by the following excerpts:

> *When I first started this class, I had no idea about wellness being a part of every dimension of my life. I now know that to obtain personal wellness, I must take on the responsibility of making the right choice.*
>
> *I try real hard to eat foods low in fat grams because I realize that fat provides 9 calories per gram, and if too much is consumed it causes heart disease. Excessive fats are also thought to aid in cancer of the colon, breast, prostate, and uterus.*
>
> *"Use it or lose it" has taken on a new meaning. I am more aware that my life was becoming sedentary. I thought that because I was a busy person I was keeping myself physically fit, but my activities were not aerobic ones. ...I now realize I can walk for aerobic exercise, which I have enjoyed doing over the last 12 weeks. My walking has helped me in all dimensions of my life.*
>
> *In order to cut my risk of cancer, I need to refrain from tobacco, over exposure to the sun, and diet correctly. I definitely need to eat more fiber foods and cruciferous vegetables.*
>
> *In closing, I want to write a big "thank you" for making wellness class one which made me aware of what I can implement in my lifestyle to make me a happier, healthier person.*

Mary had come a long way, and to learn if the assignments had any lasting effect, I called her five months after the class had ended. She told me she is still watching what she eats, reading labels, and walking whenever she gets the chance; and that she really did enjoy the class.

Many of the papers I read were like Mary's. In fact, possibly the most important benefit from the writing experience has been what I have learned about my students. They were allowing me to learn very personal things about them that I would not have known before. For example:

(1) I learned some were recovering from drug abuse or alcoholism and what they were doing to keep straight.

(2) I learned that some were abused and were working on building new lives.

(3) One student was adopted and, because that student did not know about the biological risk factors, decided it would be best not to drink.

(4) Another student was going to school full time and working 40 hours per week. The pressure was building so she decided to ask her boss if she could cut back on her hours until the semester was over, and he said, "Yes."

Even though my classes are getting larger, and it has meant more work for me, I intend to continue using these writing assignments for the coming year. They has proven to be a positive learning experience for both my students and myself.

APPENDIX A

NUTRITIONAL ANALYSIS

HLT 116
PERSONAL WELLNESS

Name________________________________

NUTRITIONAL ANALYSIS

A. Record your daily intake of food and beverage on the diet record form on page 2 (duplicate as many copies as necessary) for 3 consecutive days (Friday, Saturday, and Sunday). Indicate the name of the food, the amount or size of serving and the number of calories.

B. Please retain any nutritional information that came with the product.

C. Identify the number of servings from each food group for that meal.

D. Identify the total number of calories for each meal and the total number of calories consumed each day.

Answer the following questions (to be done in class).

1. The total calorie intake for the three day period?__________ Average?__________
2. Is this a typical eating pattern?______________________________
3. If not, why not?______________________________
4. What is your present weight? Calories needed? Wt.= __________ — Cal.= __________
5. What is your ideal weight?__________ Calories needed?__________
6. Have you gained or lost weight since (Fall)? ______________________________
7. If so, which has happened and how much?______________________________
8. Are you dieting to gain or lose?______________________________

____

Summarize as follows:

Caloric input:	Average number of calories consumed per day (+)	____(+) (#1 above)
Calorie output:	Average number of calories burned per day (-)	____(-) (#4 above)
Caloric surplus:	Difference between input and output (+ or -)	____( )

____

CONCLUSIONS AND IMPLICATIONS

1. If one pound of fat is equivalent to 3,500 calories, how long will it take you to gain (+) or lose (-) one pound if you continue these dietary and activity habits? (surplus or deficit $\overline{)3500}$ ______________ days.
2. Did you eat the recommended number of servings of the four food groups each day? Yes_____ No_____ Or over the 3 days, did you eat the total recommended servings of each food group? Yes_____ No_____
   If no, why?______________________________

____

erox copies as needed.

ONE DAY PLAN

(PLAN

BREAKFAST ITEMS	AMOUNT
LUNCH ITEMS	
DINNER ITEMS	
SNACK ITEMS	

TOTAL DAILY CALORIES:____________

	DAILY TOTAL
Dairy (2)	
Meat/Fish/Eggs (2)	
Vegs./Fruit (4)	
Bread/Cereals (4)	
Non-essentials	

Zerox copies as needed.

BREAKFAST ITEMS	AMOUNT	CAL	SERVINGS
			Dairy ____
			Meat/Fish/Eggs ____
			Vegs./Fruit ____
			Breads/Cereals ____
			Non-essential ____
			Total Calories ____
			Comments:
LUNCH ITEMS			
			Dairy ____
			Meat/Fish/Eggs ____
			Vegs./Fruit ____
			Breads/Cereals ____
			Non-essential ____
			Total Calories ____
			Comments:
DINNER ITEMS			
			Dairy ____
			Meat/Fish/Eggs ____
			Vegs./Fruit ____
			Bread/Cereals ____
			Non-essential ____
			Total Calories ____
			Comments:
SNACK ITEMS			
			Dairy ____
			Meat/Fish/Eggs ____
			Vegs./Fruit ____
			Bread/Cereals ____
			Non-Essentials ____
			Total Calories ____

TOTAL DAILY CALORIES: ____________

Comments:

DAILY TOTAL

Dairy (2)	____
Meat/Fish/Eggs (2)	____
Vegs./Fruit (4)	____
Bread/Cereals (4)	____
Non-essentials	____

Caloric Intake

Name ____________________

Section ______________

Write down everything that you eat for 24 hours (1 day). Be sure to measure the quantity as well. If you eat prepared food that has nutrition information on the label, go ahead and fill in the other information of the chart. If the food you eat doesn't have that information already, you will have to look it up in diet books in the library.

Food Consumed	Quantity	Grams of Carbohydrates	Grams of Fat	Grams of Protein	Mg. of Sodium
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
15.					
16.					

Food Consumed	Quantity	Grams of Carbohydrates	Grams of Fat	Grams of Protein	Mg. of Sodium
17.					
18.					
19.					
20.					
21.					
22.					
23.					
24.					
25.					
26.					
27.					
28.					
29.					
30.					
31.					
32.					
TOTAL					

HLT 116 NAME______________________________

Nutritional Analysis
Intake Summary

1. Calories needed ____________ Calories Eaten ____________

2. Total:
   a. Grams of carbohydrate __________ = __________ cal.
   b. Grams of fat __________ = __________ cal.
   c. Grams of protein __________ = __________ cal.
   Total calories = __________

3.

	Amount (%) Needed	Amount (%) Eaten	Evaluation		
a.	55% carbohydrate	__________%	High	Low	About Right
b.	30% fat	__________%	High	Low	About Right
c.	12-15% protein	__________%	High	Low	About Right
d.	1100-3300mg sodium	__________%	High	Low	About Right

Comments:

4. Does your diet contain enough protein?
   a. Yes
   b. No

   Comments:

5. How many ounces of water do you drink per day? ____________
   Two quarts (64 oz.) are recommended. How do you feel about your consumption level?

6. Do you feel your diet is balanced enough to meet your daily needs for the necessary vitamins and minerals?

HLT 116
PERSONAL WELLNESS

Name________________________________

Page

NUTRITIONAL ANALYSIS

Answer the question and then check whether it is a strength (+) or a weakness (-).

+	-	
		1. Which do you eat the most of? Red meat, Fish, or Chicken
		2. Do you eat a balanced diet?
		3. How are your foods prepared? Fried, baked, broiled, etc.
		4. Do you have a high or low fat diet?
		5. How much cholesterol do you eat daily?
		6. Do you regularly eat fresh fruits and vegetables?
		7. Are you eating foods that help to reduce cancer risk?
		8. Do you have a high or low salt intake? Note: pg. 83
		9. Do you eat a lot of processed foods? Eat out often? Skip meals?
		10. Do you eat too many snacks?
		11. Are your snacks nutritional?
		12. Do you drink low fat milk, whole milk, or skim milk?
		13. Do you eat low fat or no fat dairy products? (Yogurt, cheese, etc.)
		14. How much water do you consume daily?
		15. How much coffee ( ), tea ( ) or soft drinks ( ) do you drink daily?
		16. How much beer ( ), wine ( ), or other alcoholic beverages ( ) do you drink?
		17. How often do you eat cold or hot cereals?
		18. How often do you eat dessert?
		19. Do you eat more than others?
		20. How often do you eat candy, nuts, cookies or other sweets?
		21. Do you usually take seconds?
		22. Do you eat 3 meals per day?
		23. Do you eat breakfast daily?
○	○	TOTALS

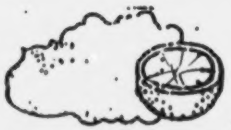
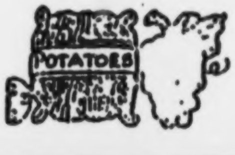
Based on what you now know, what can you do to improve your diet? On a separate sheet of paper tell me about the good and bad aspects of your diet, and what you can do to have a nutritional, well balanced diet.

NAME______________________________

"DAILY SERVINGS"

DAY/ DATE	LEAFY GREEN AND YELLOW VEG. _ Serving/Day	CITRUS FRUITS AND TOMATOES _ Serving/Day	POTATOES, OTHER VEG. & FRUITS _Serving/Day	MILK & MILK PRODUCTS _Serving/Day	MEAT, POULTRY FISH, EGGS DRIED BEANS NUTS _Servings/Day	BREAD, CEREALS PASTA _Servings/Day	BUTTER, MARGARINE _Serving/Day	JUNK AND NON-ESSENTIAL FOODS
TOTAL SRVGS.								

	SERVINGS OF FRESH VEG.	SERVINGS OF FRESH FRUITS	TOTAL NO. OF SERVINGS OF FRESH FRUITS & VEG.	OTHER	SKIM MILK	WHOLE MILK	RED MEAT	CHICKEN	FISH	EGGS	DRIED BEANS	NUTS	OTHER	ENRICHED BREAD	WHOLE WHEAT	POLY-UNSATURATED Margarine No Cholest.	BUTTER	MARGERINE	TOTAL NO. OF JUNK FOODS
# OF SRVGS.																			

	Daily Servings, One Serving	Important Sources
		Leafy Green and Yellow Vegetables --Good sources of vitamins A and E, the B vitamins, and minerals. Particularly nutritious leafy green vegetables include spinach, kale and various greens, such as Swiss chard, water cress, collard, mustard and turnip. Of the yellow vegetables, good choices include carrots, pumpkin, various kinds of squash, and yams.
	At least one serving	Citrus Fruits and Tomatoes -- The major contribution of this group is vitamin C, an essential nutrient that must be replenished daily because it is not stored in the body. Raw salad greens, including cabbage and various lettuces, are also in this group, but they are not as much in vitamin C as are tomatoes and oranges, grapefruits, tangerines and other citrus fruits.
	At least one serving	Potatoes, Other Vegetables, and Fruits --Various amounts of Vitamin C, minerals, some protein, and energy come from this group. Important vegetables here include potatoes, broccoli, Brussel sprouts, green peppers, and cauliflower -- all containing significant amounts of vitamin C. Fruits high in nutrition include berries, cherries, melons, and peaches.

Comments / Evaluation:

APPENDIX B

HEALTH QUESTIONNAIRE

LORD FAIRFAX COMMUNITY COLLEGE

NAME: ____________________

ADDRESS: ____________________

HOME PHONE: ____________________ BUSINESS PHONE: __________

EMERGENCY CONTACT: ____________________
Name / Phone #

This questionnaire is designed to help you to determine if you are ready to begin a vigorous training program. For most people a progressive training program should not pose any problem or hazzard. This questionnaire is designed to identify those for whom vigorous exercise might be inappropriate or those who should have medical advise concerning the type and amount of activity most suitable for them.

Please be honest. These forms are strictly confidential and will not be seen or discussed by anyone other than your instructor(s). If you have any questions or any of the conditions listed below, check with your physician before beginning any exercise program.

Check (X) if you have any of the health conditions below. Please specify.

_____Heart Disease

_____High Blood Pressure (above 140/90)

_____Low Blood Pressure (below 90/50)

_____Overweight (35 lbs. or more)

_____Infectious Disease

_____Diabetes

_____Internal Bleeding

_____Anemia

_____Any Lung Problems

_____Circulatory Ailments

_____Arthritis

_____Convulsive Disease

_____Pregnant

_____Low or High Blood Sugar

_____Diet that is low in calories (below 1000/day), does not contain foods from all four food groups, or does not consist of 2 or more meals per day.

Please answer the following questions.

	Yes	No
1. Have you been sedentary for several years or are you more than 20 pounds overweight?	_____	_____
2. Are you ever extremely out of breath?	_____	_____
3. Do you smoke or have any history of lung disorder?	_____	_____
4. Do you take any prescribed medication regularly?	_____	_____
5. Have you ever had a heart attack or has your doctor said you have heart trouble, or a heart murmur?	_____	_____

APPENDIX C

FITNESS ASSESSMENT

Name________________________________

Age__________ Sex____________

HLT 116

Fitness Assessment

1. Height________________
2. Weight________________
3. Wrist_____ = S M Lg Frame
4. % of body fat_________
5. B P___________ = LBP, NBP, HBP
6. Flexibility

   Sit & Reach _____
7. 60 sec. sit-ups = _____
8. 60 sec. push-ups = _____
9. Grip strength

   Dom. _____ = _____

   Weak _____ = _____
10. Cardiovascular Endurance

    Step Test = _____

FITNESS SCORE

1. Fat/Weight _____ = _____ _____
2. Curl-Ups _____ = _____ _____
3. Push-Ups _____ = _____ _____
4. Sit & Reach _____ = _____ _____
5. Step Test _____ = _____ _____

Total Points_____

Circle Your Overall Fitness Level

Excellent	25-30
Good	19-24
Average	13-18
Fair	7-12
Poor	0-6

Write a 1-2 page paper on what you can do to achieve and maintain a good overall fitness level. Base this paper on the readings, the Readiness Questionnaire, and your scores on the Fitness Assessment sheet.

APPENDIX D

WELLNESS ASSIGNMENTS

Name____ Section_________________

Topic________________________ Completion Date_________Points__________

HLT 116 - PERSONAL WELLNESS

Extra credit may be earned by completing a written assignment that has been approved by the course instructor. Up to 5% of the examination grade may be earned. Rough drafts are to be included.

Examples of Approved Assignments

1. Using the AIDS Booklet, that comes with the textbook, write a paper on AIDS and what you feel everyone should know about the subject.

2. Keep a "Fitness Log" for 8 weeks, showing date, time, weather, mileage, what you did, and how you felt. You must exercise at least 3 days per week.

3. Xerox an article dealing with personal wellness; summarize it and then explain what you found from this article to be most beneficial for you.
    a. About steroids
    b. Health '92
    c. Marijuana, A Second Look
    d. Liquid Diets

4. View one of the following, summarize it, and write a personal opinion about it.
    a. Eat Smart (video)
    b. VHS 2629: Managing Stress, 1990 (35')
    c. VHS 2758: In Search of Happiness, 1991

Augmenting Critical Thinking-Through-Writing In A Community College Introductory Philosophy Course

by

Harold G. McMullen

Professor of Philosophy and Education

Hal McMullen has been at Lord Fairfax Community College for 21 years. He holds a bachelors and doctorate from the University of Miami and a masters from Barry University.

During 1990-1992, an upgrade of the Introduction to Philosophy (PHI 100) course at Lord Fairfax Community College was planned and implemented over a two-year period. The first year planning was accomplished with the support of grant consultants and professional references through scheduled instances of in-service training and self-study activity.

The second year (1991-92) was a year of implementation and assessment along with continued instances of consulted in-service training and refinement of approaches and materials to be applied.

Since critical thinking was already a part of the Introductory Philosophy course the task became one of augmentation rather than innovation. Course augmentation by means of a demonstration project focused on the following priorities:

(1) the need to sharpen the philosophical goal-focus of "critical thinking" as an educational cognate of rationality;

(2) the need to modify the Standard Course Design and Course Syllabus to reflect the intended augmentation;

(3) The need to identify and adopt course text materials that would facilitate the course goal-focus;

(4) the need to construct, implement, and assess augmented student learning consistent with the goal-focus of the critical thinking course component; and

(5) to compose a brief summary of resulting experience and recommendations.

Since the Introduction to Philosophy course is offered as a humanities elective for all undergraduate students, without pre-requisites, no special assumptions or accomodations are made in terms of the student population that would vary from the normo-typical characteristics of adult community college students in general.

Thinking in general and critical thinking in particular have ordinarily been assumed essential to the philosophical enterprise (Edwards, p. 100-104). This component has an integral function to perform in college undergraduate courses in philosophy influenced by the intellectual heritage of Western civilization. While Western cultural priorities in the general study of philosophy have diminished in recent years, the function of critical thinking as an artifice of "Reason" continues to hold a central position fundamental to epistemology as a tool of philosophical inquiry.

A move to sharpen the philosophical goal-focus of "critical thinking" as an educational cognate of rationality has been recently proposed by Siegal (Educating Reason, p. 30). He asserts that

> ... we are fundamentally agreed that critical thinking centrally involves reason assessment and the disposition to engage in it; that is, that critical thinking involves both (1) the reason assessment component and (2) the critical spirit component of the reasons conception.
> (Ibid, p. 30, Emphasis added)

Additionally, Siegel argues that

> ... the defining characteristic of critical thinking: (is) the focus on reasons and the power of reasons to warrant or justify beliefs, claims, and actions. A critical thinker, then, is one who is appropriately moved by reasons: she has a propensity of disposition to believe and act in accordance with reasons....(Ibid, p.23)

Course augmentation, then, was proposed to expand the proportional course attention given to student coursework involving (1) reason assessment (cognitive dimension) and (2) critical spirit (affective, attitudinal, volitional dimensions).

The resulting project plans and materials included these defining goal-foci within the broader conspectus of unit activities and assessment documents. Similarly, course documents containing objectives, activities, and evaluation procedures were upgrade. Adopted text materials are also included in these documents (see Appendix A).

Primarily, the augmenting activities of the critical thinking course component included the following:

(1) an assigned set of self-instructional exercises (7) in the Preface to Philosophy text leading to the student completion of a "Student Summary Report on Informal Logic & Fallacies Exercises" (see Appendix 3);

(2) a major topical essay assignment with guidelines including reasons assessment-augmentation-critical thinking factors among the guidelines (see Appendix B);

(3) a separate oral highlights assignment further summarizing and justifying conclusions drawn in the written essay;

(4) use of an anonymous "Philosophy Student Critical Thinking Survey" (see Appendix C).

These strategies were implemented during the Fall 1991 and Spring 1992 term with some success. Faculty grade-book records and student response summaries have been retained and reviewed. Results are summarized as follows:

Student

Table 1. Completion of Self-Instructional

CT Skills Text Exercises

	Fall 1991	Spring 1992	Total
Adequate completion:	36	50	86
Inadequate completion:	7	9	16
Total:	43	59	102

The completion rates are considered appropriate to the student population circumstances. Additionally, the data reported in the next two tables are valid only within the demonstration project and bear no particular inferential use.

Table 2: Comparison of Student Written Essay Grades and Oral Essay Grades Including A CT Factor

	Fall Semester 1991		Spring Semester 1992	
Grade	Written	Oral	Written	Oral
A	20	13	31	22
B	25	22	23	23
C	5	15	1	9
D	0	0	0	0
F	1	1	1	2

Table 3. Student Self-Identification As A 'Critical Thinker'

In response to a question on the Philosophy Student Critical Thinking Survey: "Are You A Critical Thinker?":

Fall Semester 1991			Spring Semester 1992		
Yes	Sometimes	No	Yes	Sometimes	No
24	10	6	19	25	4

The results of the above anonymous student survey are of limited interest. The diversified self-identification responses reflect the developmental-growth patterns that might be expected in a heterogenous student mix. To the extent that undergraduate students exercise freedom to selectively "buy in" to cognitive styles and learning modalities without imposition then the educational expectations are congenial with project results.

The retained grade data, survey documents, as well as anecdotal data, reflect widespread general student satisfaction with the critical thinking course component. Unstructured comments by students frequently expressed a sense of learning growth that was thoroughly "owned" by the individuals in both cognitive and non-cognitive ways.

A "critical thinking" unit will be retained in the Introduction to Philosophy for the foreseeable years ahead. An update of texts has already been made for next term. These selections are listed in the bibliographic section.

Finally, several concerns for future coursework will guide continued implementation. These include:

(1) a mindful recognition that "critical thinking" components of undergraduate courses require a more neutral expectation with respect to preserving diversity of student growth;

(2) that the "critical thinking" component is widely accepted by students to the extent that they personally appropriate stipulated meanings and uses in learning;

(3) that the "critical thinking" mode be carefully compared with the various non-cognitive modes of consciousness available from non-western tradition and a growing feminist critique in general philosophy. The positive implications of a more thoroughly holistic perspective in philosophy studies is encouraging for augmentation units dealing with more "epestimec awareness."

APPENDIX A
TEXTBOOKS ADOPTED DURING PROJECT

Textbooks Adopted During Project
(1991-1992)

White, Thomas I. Discovering Philosophy, Englewood Cliffs, N.J.: Prentice-Hall, (1991), 510 pgs.

Woodhouse, Mark B. A Preface to Philosophy, (4th Edition) Belmont, CA: Wadsworth Inc., (1990), 160 pgs.

Textbooks Adopted for Post-Project
1992-1993

Earle, William James. Introduction to Philosophy, New York: McGraw-Hill, (1992), 308 pgs.

Miller, Ed. L. Questions That Matter: An Invitation to Philosophy, New York: McGraw-Hill, (1992), 601 pgs.

APPENDIX B
PHILOSOPHY ESSAY ASSESSMENT

PHILOSOPHY ESSAY ASSESSMENT

	Formative Elements:	Rating Scale				
1.	Topical Clarity	O	D	C	B	A
2.	Thematic Consistency	O	D	C	B	A
3.	Philosophical Tone	O	D	C	B	A
4.	Composition Skills & Format	O	D	C	B	A
5.	Reference Adequacy	O	D	C	B	A
6.	Introductory Statement	O	D	C	B	A
7.	Concept Definition & Clarity	O	D	C	B	A
8.	Analysis	O	D	C	B	A
9.	Synthesis	O	D	C	B	A
10.	Evaluation	O	D	C	B	A
11.	Focused Conclusions	O	D	C	B	A
12.	Argumentation	O	D	C	B	A
13.	Critical Thinking	O	D	C	B	A
14.	Special Merit	O	D	C	B	A
SUMMATIVE EVALUATION:		(Re-Submit)	D	C	B	A

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APPENDIX C

PHILOSOPHY STUDENT CRITICAL THINKING SURVEY

Philosophy Student
Critical Thinking Survey

1. What is "critical" thinking?

2. List the most significant skills and characteristics of the "critical thinker:

3a. Are you a critical thinker?

3b. Explain your response to 3A?

4. Comment on the critical thinking factors experienced in this course:

5. Did you enjoy doing the writing assignments?

6. Do you think the writing assignments helped you to learn important concepts?

7. Which writing assignments were the most helpful to you?

8. Which writing assignments were the least helpful to you?

9. What other writing assignments would have helped you to understand important concepts?

10. What other comments do you have about the writing assignments?

Thinking Through Writing
About Art

by

Lahna Neely

Lecturer in Arts

Lahna Neely received a B.A. in Art from Shepherd College, Shepherdstown, West Virginia, and a M.A. in Art from James Madison University, Harrisonburg, Virginia. She has taught art history and studio art courses at Lord Fairfax Community College since 1972.

This grant-funded project, Thinking Through Writing, was intended to help students think more critically by improving their writing skills. One of the problems with their writing is that they do not think or express themselves clearly when they are fearful of their grades and are pressed for time. By improving the circumstances in which they write, I found a corresponding improvement in the essays.

Another factor influencing their thinking skills is the difficulty of material being thought and written about. It was in this area that I gained the most useful insights. Specifically, I learned that communication is often uneven and that my assumptions about what my students understand are sometimes incorrect.

I have, for some time, been concerned about my students' inability to write answers to essay questions. They seem to be unfamiliar with their own language, they have meager vocabularies, a poor concept of grammar, and have limited graphic ability. If I could read their writing, I could not understand what they had written.

When written under pressure, the students' essays sometimes exhibited bizarre visual characteristics. Unusually cramped writing, sometimes so tiny that it is unreadable, may hint at the student's desire not to be read. Waves and hillocks in the line of writing trace a panicky search for an acceptable answer, as the example below suggests.

Define Impressionism and explain its role in 19th. century art.

Is a ~~the~~ time in which people started using there fellings and sharing they in their work.

I also have observed that the simple task of copying the question in one's own handwriting increases the likelihood of a correct answer. Conversely, when the student fails to copy the question, inevitably even a good student misreads it and gives an answer to a different question. In the following example, the student was asked to contrast Greek art in the Classical and Hellenistic periods. She answers by describing the art of the Greeks and Romans.

Greek art was produced
to bring honor to the "polis"
and to be appreciated by the
public. Roman art, in contrast,
was produced to be owned
and appreciated privately.

Because History and Appreciation of Art is a one-year course, and many students take only one semester, I cannot accurately trace the progress of individual students for a two-year period. However, I think the essays improved greatly during this time as my teaching style underwent its own evolution.

In the beginning, the essay questions were a segment of the test and provided a percentage of the total grade. Students performed under pressure of time and fear of losing points. Although the questions required some analysis, they were structured to limit the answer, and required recitation of material presented in class, or to be found in the book. I considered that they had to be this way in order to be fairly graded.

The answers to questions, such as in the example below, were graded for accuracy.

Name____________________________

Essay Question--Your answer is worth 10 points.

Using Rembrandt's painting Night Watch as an example, describe the elements of the Baroque style of painting.

Please use complete sentences. Please write clearly.

After the tests were graded, and we were reviewing them in class (wonderful timing,) I explained how I wanted the answers to be written. This explanation evolved into a demonstration essay. (see Appendix A) The value of the demonstration was increased by presenting it **before** the test.

In implementing the new strategy, I retained the objective part of the test but made the essay extra credit. The essay question followed the original format and was still part of the test. My intention in making the essay extra credit was to reduce anxiety, but the result was that students devoted less time to answering these questions, and some chose not to write at all.

The next step was to eliminate the essay from the test and to present it as an unannounced classroom activity. Students were allowed to work in groups, but I determined the membership of the groups.

This exercise began with a demonstration essay based on a true-false question from a recent test: "The Romans valued realism in their art. T or F?" Reminding them that the answer is "true," I asked them to recall what evidence supported that answer. Writing on the chalkboard, I narrated the process of turning the question into a topic sentence, quoting from the textbook, citing visual examples, and explained how to limit the answer for a short essay, or expand it for a long essay without meaningless filler materials.

The demonstration was followed by two small-group writing exercises on similar subjects, one a compare-and-contrast question, and one a very general question which required the students to determine the limits of the answer.

Writing as a group activity is successful in that the students are less nervous about the assignment. I have also found that in a class with a mix of student ability (common in community colleges), the more skilled students will assist those who are less experienced, and each will participate at his own level. However, large classes of restless students cannot work in groups or chaos results. I have not given up on writing projects for these classes, but the students must work individually.

Adequate time, lessening of anxiety and, eventually, the inducement of extra credit to encourage participation have resulted in vast improvements in structure, analysis, and accuracy of answers. The essays are more legible, longer, more eloquent, and grammatically correct. Students are learning to limit their answers or expand them, as requested, and to specifically answer the question asked. Moreover, I can ask questions that are more complex and challenging (see sample essays in Appendix B).

Progress, however, is uneven. There is no magic formula that works all the time. The instructor must intuitively determine what approach is most suitable at a given time. For example, sometimes the natural flow of the class will present an opportunity for writing. I found one at the end of the study of Neo-classicism, in the pause before introducing the Romantic period.

To summarize the lecture material, students were asked what Classicism meant to them, and what part it plays in their daily lives. Working individually, they wrote thoughtful examples from cake decorating, interior design, and political opinion, e.g., "without Classicism, civilization would crumble."

Asked to identify the classical features in a twentieth century painting by Leger, working in small groups they discovered "strong horizontal and vertical lines," "geometric shapes," and "simplified human forms" that hint at "a technology that makes robots out of humans."

In the architecture of Monticello, students saw "wealth, tradition, and learning." In the columns and classical motifs they found "symbols of strength and serenity in an unstable world."

This was one of the most successful writing assignments. Even the boys in baseball caps surprised themselves by having something to say.

But Classicism is easy to teach and to learn. As the subject matter of the course becomes more abstract and complex, the quality of the essay declines. The students have not lost the ability to write, but the thinking is harder.

In assigning the question, "How is Photo-Realism an example of Roy Lichtenstein's statement 'Organized perception is what art is all about'?", I suggested that they begin by answering a series of questions, such as: "Who is Roy Lichtenstein?" "What does his art look like?" "What does he mean by 'organized perception'?" "What does Photo-Realism have in common with Lichtenstein's paintings?" (These questions were discussed and illustrated in class, and the students were allowed to use their textbook and class notes to write their essays.)

Interestingly, most students handled the mini-questions well, but when they approached the task of putting the material together to answer the original question, their brains short-circuited. They wrote randomly, as if searching for some other question to answer. Although they were capable of copying the information from the notes, I believe that they did not understand the question and did not see how the answers fit together.

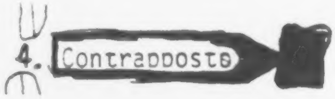
One student found that "Roy Lichtenstein was an American Pop artist. He specialized in dot-matrix painting, an enlarged perception of the dots that make up comic strip pictures." In her essay she abandoned this accurate description and began her essay, "Lichtenstein's method of painting causes it to be up-close and personal. It is almost overwhelming," — a totally meaningless analysis, coming from God-knows-where. Later, she commented, irrelevantly, "Lichtenstein was 'of his own time' in that he was using the dot-matrix format." She never mentioned Photo-Realism in her essay, although it was correctly identified in her notes.

Why did this happen? I thought I had explained and illustrated this topic as thoroughly as any other material presented in class. The students had not protested that they did not understand. Probably they thought they did understand what I told them. At least they knew the words and could correctly match the information with specific questions.

Obviously the nuances of imagery and selective reality are more difficult to understand and require more experience with art than I realized or remembered.

I have not discounted the possibility that I did not present the material well enough, and I will continue to find ways to refine and improve my lectures. But art is not a verbal medium. There are things about art that are not readily explained. These are things that one "comes to know" and it is very possible that in a one-year freshman-level course in art, the students will not come to know all that I want them to learn.

In conclusion, I think that the writing exercises were made valuable in my art classes by removing the pressure of testing and grading from the assignments. For the students, writing presents an active alternative to the passive role of listening and taking of notes. They always benefit from an opportunity to organize their ideas and express them in writing. For me, the essays are a valuable clue to the give-and-take of communicating and understanding.



Thinking Through Writing

by

Nancy Penney

Associate Professor of English and Developmental Studies

Nancy Penney has taught English and developmental studies at Lord Fairfax Community College since it opened in 1970. She obtained her B.A. from Mary Washington, and her M.Ed. from the University of Virginia where she also did graduate (ABD) work.

During the last twenty years I have taught English at Lord Fairfax Community College, and I have always been interested in helping my students learn better and more easily. During the past few years of the "budget crunch" that interest has increased because cutbacks have increased my class sizes (and everyone else's) and work loads so that I am able to devote less time and less attention to individual students and courses. In my American literature survey courses and in my developmental reading courses I especially had some concerns about how well and efficiently my students were learning because class size had increased.

In American literature one afternoon, I called upon a young man who always seemed to be listening carefully but never participated in class discussion. I asked him about his interpretation of one of the poems we were discussing and he replied, "Oh, I always read the poems before class, but I don't think about them because I've never been good at understanding poetry; I wait to get to class and hear what you say they mean." I was appalled at that response and since that afternoon, I have done a lot of thinking about students who read but do not "think" about what they read. One of the most important goals of any literature class is to get students TO THINK about literature and learn how to read and understand it; it is not just to learn some biographical and literary points about a few of the world's better known writers.

Obviously, to improve in literary interpretation, students need to practice doing it, but they are often self-conscious about saying aloud in class an idea they are very unsure of and this situation often leads to only a few self-confident students doing all the participating in class discussions. As classes get larger and larger, this becomes more and more true.

In my developmental reading classes, I encountered a similar problem. These students have often been placed in these classes because placement tests have indicated they have reading problems and are not ready to begin with college-level texts; hence they are often very insecure about their ability to understand what they read. When we are working with main idea paragraphs for instance, they hesitate to say what they think because they are sure their answers can't be right. Because they know they are not going to answer aloud in class, many of them really don't try to figure out what the answer is or could be. In other words, they are really not practicing the skill at all. Again, as developmental classes get larger, this problem escalates.

During a workshop, I saw an example of a chemistry student who had attempted to articulate a question for his professor's question box. The example showed clearly that the attempt to put the question into words had clarified the concept for the student, and halfway through, he had stopped and written, "Oh, I get it. Thanks." Thus, he thanked the professor for what he had done for himself just through the act of writing. I felt the answers to some of my own concerns might lie in thinking through what that meant.

I remembered back in college when I was writing papers and that writing things made me clarify what I thought. It was often a "how do I know what I think until I try to write it" situation. I decided that part of the problem with student learning is that the students are trying to learn without thinking about what they reading or studying. With sort of a T.V. mentality, they are passive and are not trying to interact or respond to the material. Everyone who teaches study skills or SQ3R or any other study method knows that being passive is a very poor way to go about learning anything, and in large classes where students can get away with not having to articulate their thoughts until test time, if then, they are not actively interacting with the reading and ideas they are hearing.

It was my belief that writing assignments and activities could force the students to deal more actively with the texts and materials they were studying; could make them explore possibilities of meanings without exposing them to potential "public" ridicule. During the first year of the grant, I read as much as I could about writing to learn, holistic grading, journal writing and any other subjects that appeared to have relevance for what I wanted to achieve. I wanted most of all to be sure every student in my classes was responding to the material, and was thinking about what they read, and what it meant without the fear of public ridicule. The two classes, reading and American literature, are very different, but I felt that writing could help my students do better although the actual activities would have to be very different.

In my American literature survey classes, we cover a great deal of material, much of it fairly abstract. I was looking for writing activities that would make them read less passively, remember more of what they read, but also help them interpret some of the more abstract works more effectively. The first thing I assigned was a notebook/reading journal. For each author and selection they read, they were to write a response. I did not specify what the response had to be; it could be a summary, a comparison with personal beliefs and views, a contrast with other authors studied, whatever they wished. I hoped that as they read, they would be thinking and questioning. "What can I say about this?" "What's here?" "What does this mean to me?" Thus, they would be reading more actively. They were to have their notebooks in class each day and periodically I would pose questions on one of the selections and ask them to respond in writing before we discussed the point in class. This way I hoped to insure that they thought of a response whether or not they planned to talk in class. Some were simple summary type questions, i.e., what seems to be John Smith's purpose in his article? Others tried to be more imaginative, i.e., what could a modern person be asked to do that would be equivalent to what Bradford and his fellow Puritans did when they left Holland for the New World?

Periodically, I took up the notebooks and scanned them. In each notebook, I responded here and there with a remark or question but did not "grade" them. Each time I collected the notebooks, there would be a certain number of entries and they only lost points if they were missing an entry (20 entries earned 5 less points for each missing entry). The notebook grade counted equally with the quiz grades. The student who kept up with the notebook entries was assured a 100 each time I took up the notebooks which was two or three times a semester. With classes at 36 plus, I did not have time to "grade" the entries, but this way they got credit and I had only to scan them quickly. I must admit, I really enjoyed reading the notebooks and felt they made me aware of misconceptions and interesting interpretations that I otherwise would have missed. I also felt I knew my students a bit better and more personally, something I've been concerned with as my classes have gotten progressively larger. It became apparent that the students often wrote as a private dialogue with me, and I think that increased their ownership or commitment to the class. Overall, I was very pleased with this activity, and I learned a great deal from the students also.

In addition to notebooks, I had students do individual writing assignments, usually a paragraph to a page, on some of the more difficult lessons. In developing these assignments, I attempted to cover a wide range of reading and interpretive skills, some literal comprehension like, "In Frost's 'Acquainted With the Night,' what is the poet doing?" Some were more interpretive like " 'In After Apple Picking,' what else could Frost be talking about besides an apple harvest. Explain." Some focused on application like the assignment that asked students after reading Emerson's words on charity ("the poor are not my poor...") to say what Emerson's response would have been to the story of the man who did not give money to the homeless, but each day brought an extra sandwich to give a homeless person. Others attempt to make them think more abstractly or critically like: "If I asked you to create an abstract painting that reflected Frost's poem "Mending Wall," what would it include and what would it look like? Like the notebooks, these assignments were not graded and there was no "right answer"; they got complete credit if they did a paragraph or page on the topic, and it was averaged as a quiz grade. We did have class discussions on the assignments and a secondary benefit of the activity was that I noticed more class participation than I had seen in previous years. Partially, I attributed this to the fact that some students need more time than others do to think things over and, while they are not shy or unintelligent, they are not ready to respond instantaneously. The writing time alloted, although only a few moments, allowed them the needed time to collect and arrange their thoughts and then they were more willing to respond in class.

All during the semester I also used writing as a means of giving the students a few moments to think through something before a discussion. These little activities were much more informal than the ones noted above and were not graded at all. In their notebooks or on any sheet of paper, I would pause a minute after posing a question and ask that they jot down a response. Is Emerson right—"the poor are not my poor." Would Thoreau have agreed with the sit-ins in the sixties? Does Ginsburg help or hurt his cause through profanity? Does W. C. Williams present a negative or positive image in "Between Walls?"

The students were also told in the first class that there would be an essay component to the midterm and final, and they were given four questions to help guide their reading and studying to prepare them for the tests. The questions would be a bringing together of some of the authors or points we had studied but would not be something we had actually discussed in class. Just before the first test, I also conducted a study session on how to turn the question around as the introduction to the answer. I also spent time on how to substantiate an answer with specifics from the works; the essay questions on their tests have no one "right" answer but are evaluated on how well they show how their points are reflected in the works.

Over the past two years, I feel I have noticed an improvement in the originality and thoroughness of the student responses on essay questions. I believe that the assumption that knowing the material means constructing a good essay response was not an accurate presumption. In this case, I think showing how to do this type of writing frees them during the test to concentrate on the answers and not the construction of the response. Many times the essay questions ask about the material in a way that we have not discussed in class, i.e., comparing and contrasting authors or certain works or interpreting some earlier work in the light of modern thought, and I want them to use the energy to consider the material in a new way rather than be focused on how to write the answer. In this way the test is also a learning experience as well as an evaluative one.

In my developmental reading classes, I do not have to give grades (the course is pass/fail) and that allows for more informal assignments. Essentially, for this class and these students, many of whom are insecure and lack confidence, the notebook/reading log is an important way for them to express questions, opinions, and interpretations without the worry over public ridicule. The notebook idea worked very well from the first part of class when we worked with one and two sentence "main idea" exercises to the last when we were working with whole articles. For the short readings, students read in class and then jotted down in their own words the author's main point (grammar and spelling, of course, were unimportant here). Then we discussed it, and I could get several responses on the board and we debated which most accurately reflected what the author was saying. When the assignments were long, the reading was done outside of class and the students were supposed to write down the main idea in their own words and bring it to class. I used the same technique on implications, important detail, critical reading (propaganda), and other reading skills. Again I felt this had the added benefit of letting more reflective students have a chance to respond in class even though they take a while to gather their thoughts. It also showed some of the reticent ones that they did have right answers; they had the right answer in front of them even if they hadn't spoken up in class to say it.

Another way I used the writing in the reading classes was to have them answer some questions about their reading skills, strengths, weaknesses and goals for the class. I find that most students know what they don't know and what they want from the class, but if they don't, I want them to think about it before they begin work. Throughout the semester, I have them write in their notebooks some progress reports (ungraded-but I do write back). At the end, I had them write me a letter evaluating their work and their progress toward the goals and objectives they first set out. After I've read the letters, I talk with them individually about their progress, and we discuss whether or not they feel ready for the heavy reading loads in credit, college-level classes.

Overall, I was very pleased with the writing in the reading classes. I noticed more class participation than before even though those classes have increased to 18-20 (in the past they were usually 12-16) and the greater number usually inhibits class responses. Again, I felt that the writing allowed the more deliberate person more time to get a response ready even though it was only a few minutes longer.

After 22 years of teaching at Lord Fairfax Community College and 24 years of teaching altogether, I think my perceptions of change and improvement have some validity, but I also wanted an outside measure. I constructed a survey for each class and asked that they respond. I explained a little about the project and told them that their responses would not make any difference to them but would help me change and/or improve the class for the others who would come after. They responded numerically, and I also asked them to take time to share comments with me. The results of those surveys follow.

In the American literature class, 47 students filled out the evaluative questionnaire. The results are reported below. The questions that they responded to, and some sample comments are included after each item.

The students were told to respond to the questions by using the following ratings: 4 - strongly agree, 3 - somewhat agree, 2 - somewhat disagree, 1 - strongly disagree.

1. WRITING ENTRIES IN A NOTEBOOK MADE ME FOCUS ON WHAT EACH AUTHOR WAS TRYING TO DO AND SAY.

4 - 66% 3 - 34% 2 - 0% 1 - 0%

Sample Comments:

It helps you remember better, but it also makes it easier to study.

It helped and it made me keep up with the assignments.

We read a large number of authors and this helped me keep them straight.

As I went along in this class, I would find myself returning to my learning log again and again to get input from past remarks.

2. WRITING BRIEF RESPONSES TO QUESTIONS POSED IN CLASS MADE ME THINK MORE ABOUT THE TOPIC THAN I WOULD HAVE IF THE QUESTION HAD JUST BEEN PROPOSED FOR ME TO THINK ABOUT.

4 - 49%   3 - 49%   2 - 2%   1 - 0%

Sample Comments:

When I write something down, I think about it more than if I just think.

I probably wouldn't have bothered to think about the questions if they hadn't been assigned in our journal.

Absolutely! It always helped me to understand some of the poets who were difficult.

3. THE WRITING ACTIVITIES THAT ASKED QUESTIONS ABOUT THE ABSTRACT POEMS, i.e., "J. ALFRED PRUFROCK", "BETWEEN WALLS", AND "AFTER APPLE PICKING" MADE ME CLARIFY WHAT I THOUGHT THE POEMS WERE ABOUT AND WHAT THE AUTHOR WAS TRYING TO DO.

4 - 47%   3 - 45%   2 - 8%   1 - 0%

Sample Comments:

These really helped.

I find abstract poems sometimes difficult to interpret and these helped.

This helped me see different views on poems.

4. THE MORE ABSTRACT WRITING ACTIVITIES AND QUESTIONS, i.e., WHAT WOULD YOU PAINT IN RESPONSE "TO NOTHING GOLD CAN STAY" OR "AFTER APPLE PICKING", HELPED ME TO THINK MORE CREATIVELY ABOUT THE WORKS OR TO THINK ABOUT THEM IN A DIFFERENT WAY THAN I WOULD OTHERWISE HAVE CONSIDERED.

4 - 45% 3 - 45% 2 - 10% 1 - 0%

Sample Comments:

I didn't know I had any creativity in me until I attempted these assignments.

These made me realize and appreciate the artistic talent that poets are able to express in their works.

Working with these poems also helped me later when we got to other poems.

5. THE ESSAY QUESTIONS ON THE EXAMS MAKE ME PULL THE MATERIALI HAVE STUDIED TOGETHER AND HELP ME ASSESS WHAT I HAVE LEARNED AND WHAT I THINK ABOUT THE LITERATURE OF AMERICA. KNOWING I HAVE TO WRITE ABOUT THE WORK MAKES ME TRY TO DO MORE THAN JUST MEMORIZE DETAILS.

4 - 68% 3 - 28% 2 - 4% 1 - 0%

Sample Comments:

This is very true. While studying I tried to compare and contrast the authors and works.

This helped more than the other five. It serves as a good summary of the class materials.

The essay questions are tough, but they make you think about the literature deeply.

You have to be able to relate the material to something; it is too much to memorize.

I wasn't sure how much I really knew until the essay questions.

In order to answer these questions, you really had to know the material.

6. OVERALL, THE WRITING I HAVE DONE IN THIS CLASS HAS HELPED ME TO LEARN THE MATERIAL, REMEMBER WHAT I READ AND STUDY, AND THINK MORE EFFECTIVELY AND CRITICALLY ABOUT THE SUBJECT OF AMERICAN LITERATURE.

4 - 79% 3 - 21% 2 - 0% 1 - 0%

Sample Comments:

All these writing assignments really helped me. I like to read, but writing is not one of my favorite hobbies. This is really a great idea.

This literature course is really demanding and these assignments helped me to keep track of the writer's works and their contributions.

Writing in English classes is very important.

Definitely helped me to learn the material. All the writing activities helped me to better my abilities in comprehending literature. I feel what you had us do was very appropriate; I love the way you teach, and I loved your class.

There was only one reading class in the spring and 12 of the students responded to the survey. The results are shown on a sample survey form.

I am participating in a research project on using writing to help students learn and better understand their classwork. I need your help in trying to assess whether the writing activities do, in fact, help students think more clearly about what they read and what it means. Please rate these questions thoughtfully and carefully in order to help me decide what to do next year. Thank you.

Next to each question, place the number that reflects most accurately your rating of the statement.

4 — strongly agree

3 — somewhat agree

2 — somewhat disagree

1 — strongly disagree

Please also write your comments showing your assessment of the point made.

OFTEN IN CLASS, I HAD YOU WRITE A SENTENCE OR TWO ABOUT WHAT YOU THOUGHT SOMETHING MEANT - WRITING THE RESPONSE MADE ME THINK MORE CONCRETELY AND CLEARLY ABOUT THE SUBJECT THAN JUST THINKING ABOUT IT WOULD HAVE.

4 - 59%   3 - 33%   2 - 8%   1 - 0%

Comments:

It made me put more effort when it came to homework.

To put something in writing really helps you to understand it.

WHEN WE DID SUMMARIES OF ARTICLES, I HAD YOU WRITE RATHER THAN JUST SAY IN CLASS WHAT YOU THOUGHT THE ARTICLES WERE ABOUT. WRITING THE SUMMARIES MADE ME THINK MORE CLEARLY AND PRECISELY ABOUT WHAT THE AUTHOR WAS TRYING TO SAY.

4 - 83.4%   3 - 16.6%   2 - 0%   1 - 0%

Comments:

It was a lot of work, but it paid off.

I was able to understand the main point much better.

OVERALL THE RESEARCH PROJECT IS BASED ON THE IDEA THAT WRITING ABOUT SUBJECTS HELPS STUDENTS UNDERSTAND, INTERPRET, AND REMEMBER THEIR CLASSWORK. - I FEEL THE WRITING I DID IN THIS CLASS HELPED ME TO IMPROVE AND LEARN NEW READING AND STUDY SKILLS.

4 - 66.6% 3 - 25% 2 - 8.4% 1 - 0%

Comments:

You learn to concentrate.

I think this is very true.

DO YOU FEEL THAT YOU UNDERSTAND WHAT YOU READ BETTER THAN YOU DID IN JANUARY? EXPLAIN BRIEFLY.

100% said yes.

DO YOU FEEL YOU READ FASTER AND MORE EFFICIENTLY THAN YOU DID WHEN YOU BEGAN THE COURSE? EXPLAIN BRIEFLY.

100% said yes; some felt they made great progress and others, some.

The results of both surveys reinforced the positive feelings that I had throughout the year about the "Writing-to-Learn" activities. In both the literature and reading classes, the student responses in class were more frequent, more thoughtful, and more generalized. In the literature classes, the essay question responses were better, more organized, and I felt, even more creative. The surveys showed that the students also perceived a benefit through the writing activities. Some of them did not like the extra work but almost all of them recognized the improved learning results.

The unanticipated benefits were especially pleasing to me. With the classes getting larger and the workload more hectic, these writing assignments gave me a feeling of knowing my students and also kept me aware of what they were not understanding before we got to the testing situation. Because most of the assignments weren't graded, the time needed to respond to them was very little. A comment in the margin, a smiley face, a recommended book on the mentioned subject allowed me to interact with them but without a large expenditure of time. I could get some of them scanned in the 10-20 minute breaks between classes or over a cup of coffee while waiting for a student to come for an appointment, and I could never do that with graded tests and more exacting graded writings. For a little extra time, I got a wealth of positive results.

As a result of this project, I think I am a better teacher and my students learn more for the time they spend in my classes. I plan to continue these activities and to look for others that will allow students to write to learn.

Teaching Concepts Through Writing in an Anatomy and Physiology Class

by

Ramon R. G. Selove

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INTRODUCTION

Why write?

I teach anatomy and physiology. Learning anatomy is mostly an exercise in memorization, while learning physiology is mostly conceptualization. It is my perception that as class sizes have grown and forced professors into easily graded, objective exams, anatomy has been stressed at the expense of physiology. I tell my students, "who gives a damn what something is called or where it is if you don't know how it works?" In other words, it is pointless to know things without understanding them.

This problem is not isolated to anatomy and physiology or even to science. I think it is the largest single problem in education in general. It is very easy to write tests that assess memory. It is more difficult to assess understanding and thinking. Essay tests have always been my standard mode of making these assessments but I abandoned them when I taught classes of 250 at Ohio State University. I felt very guilty about eliminating these tests but in some ways I was grateful not to have to read them. It was painful to see irrefutable evidence of how badly my lectures could be misunderstood. As good as they are as a tool for assessing understanding, essay exams do not teach understanding. They do not teach thinking.

Another reaction to my very large class sizes at Ohio State was a policy on disputed exam grades. When students wanted to dispute the answer on a multiple choice exam they had to do so in writing. I even made them type it and I refused to consider appeals that were poorly worded. My purpose, of course, was to discourage students from making any appeals in the first place and it was a very successful policy. As I read the appeals that were submitted, I began to notice something else. In the process of writing these appeals, many students were finally realizing what they had done wrong in the first place.

This experience was fresh in my mind when I came to Lord Fairfax Community College the following fall. I was invited to come early to attend a workshop conducted by Toby Fulwiler and join the Thinking Through Writing grant team. I already appreciated the power of making students do their "thinking on paper" but I couldn't see how to incorporate it into a science class.

The Use of Analogy

An essential component of my teaching philosophy has always been to use analogy to bring difficult concepts down to the level of my students. Most of the concepts in physiology are not exclusive to physiology. It is often easier to explain a concept as it applies in a student's everyday life and then show how the same thing applies in physiology. I tell my students that they already know most of physiology. All I do is show them how to apply their previous experience to physiology. I think I have a natural gift for seeing these analogies, and I think that explains why I have done so well in school. I wanted to find a way to teach my students to use my method themselves and it was this basic idea combined with the power of thinking through writing that inspired the assignments I wrote for this project.

The Assignments

Each week of lecture I took what I considered to be one of the more difficult concepts and asked the students to write about it. Generally they were asked to find some non-biological analogy and explain how the same concept was at work. Students are often able to memorize all of the examples I go over in class without really understanding the concept itself. When I ask them to find their own examples they have to understand the concept in order to find and explain a valid example of it. I think every teacher has had the experience of understanding something only after they try to explain it to someone else. The students experience some of that in explaining it to me in the writing assignment but the effect is enhanced because I make them consult with each other before they can turn it in. In explaining what is right or wrong with an example to a fellow student, the students often get a flash of insight themselves.

My grading of these writing assignments is a bit out of the ordinary. There are only two grades given: full credit and zero. Correct, well-written examples are given full credit. If an example is incorrect in any way or if it is badly explained, it receives no credit and an explanation of what is wrong. These assignments can be repeated as many times as is necessary to get them right with no loss of points. My purpose was that this be a learning exercise, not an evaluation.

She general instructions that I give to students can be found in Appendix A. Appendix B is a sample writing assignment handout. The assignments I gave during this project can be found in Appendix C.

POPULATION

This project was done in a two semester Anatomy and Physiology class during the Fall of 1991 and the Spring of 1992. I had approximately 80 students in each semester distributed into 2 lecture sections and 4 lab sections. Most of my students are studying for jobs in the health professions. About 90% are female and about 60-70% are older students who have come back to school to get a degree. I have generally found that what older community college students lack in preparation and ability, they often make up in maturity and motivation.

TESTING PROCEDURE

In the first few weeks of the first semester I discuss eight properties that are unique to water.. These properties make water the most important biological molecule. Two of the writing assignments asked student to choose one of these properties and explain how that property effected some event in their day-to day lives. Each student did writing assignments on two of the eight properties but did not do assignments on the other six. Since different students chose different properties to write about, for any one property I had a group of students that had done the assignment and a group that had not. I compared the results of these two groups to see if the assignment had any effect on the students performance on a short essay exam.

On the regular exams the students were responsible for knowing all eight properties. At the end of the semester (about 12 weeks after our class discussions) I gave an exam on the properties without warning the classes beforehand. I wanted to see how well they could do without studying. (This exam was not part of the students' grades.) I also gave the students a questionnaire of the writing assignments to try to gauge how helpful they thought the assignments had been. Samples of the exam and questionnaire can be found in Appendix D.

Each question of the exam was either scored as incorrect or, if correct, was given a rank: 1 for essentially correct, 2 for correct, and 3 for an excellent answer.

Responses to the first two questions on the questionnaire were scored as being very negative, negative, neutral, positive, or very positive. The questionnaire was given again at the end of the second semester.

RESULTS

Results for each of the properties of water that were tested may be found in Appendix E. Exam results were as follows: Out of 91 answers written by students who **had** completed writing assignments on the same property, 85 (**93.4%**) were correct. Out of 285 answers written by students who **had not** completed writing assignments of the same property, 182 (**63.8%**) were correct.

Results of the questionnaire were as follows:

Fall 1991- Did you enjoy doing the writing assignments?

very negative-1 negative-22 neutral-10 positive-28 very positive-7

Spring 1992- Did you enjoy doing the writing assignments?

very negative-2 negative-27 neutral-6 positive-36 very positive-6

Fall 1991- Do you think the writing assignments helped you to learn important concepts?

very negative-0 negative-3 neutral-4 positive-43 very positive-18

Spring 1992- Do you think the writing assignments helped you to learn important concepts?

very negative-0 negative-4 neutral-5 positive-51 very positive-17

DISCUSSION

These results appear quite dramatic. It would be tempting to say that the technique of these writing assignments had raised performance levels from D (63.8%) to A (93.4%). It is not as simple as that. Students did have their own choice of which writing assignments to do, and they could have chosen ones that they already knew the best. This could account for the better performance on the properties they chose to write about. However, very few of my students have any background in physics, chemistry or even biology when they take anatomy and physiology and so it is not likely that prior knowledge could account for the entire effect. Nearly all of the students (129 out of 145 responses or 89%) reported that they believed that the writing assignments had helped them. Even those that reported that they did not enjoy the assignments admitted that the assignments had helped. Only 5% (7 out of 145) thought that the assignments had not helped them and some of their comments show that they really had helped. One student wrote, "I had to understand the concept before I did the assignment, therefore the writing assignment itself didn't teach the concept." I would have to agree. The learning does not occur on the paper; it occurs in the mind. What is on the paper is evidence of learning not the learning itself. But this student equates "writing" only with the physical act of putting words on paper. The thought that is required to put those words on the paper is part of "writing" also and these assignments forced students to think in ways that they might not otherwise.

Other students wrote:

(The assignments helped me learn) pretty much, but even more important I think they helped me remember those concepts.

Certainly (the assignments helped me learn), in fact, without some of the assignments some of the concepts would have remained 'fuzzy.'

I can relate many concepts to everyday things that I wouldn't have seen before.

The writing assignments are a great way to help students understand physiology.

I learned that, perhaps, the only way to make sure you really understand a concept is to be able to explain it to someone else.

When students gush over assignments that took a great deal of effort one may rightly wonder if a "fraternity effect" is being observed. Having survived a harrowing initiation, students may take steps to ensure that the next class after them doesn't "get off easy". That, however, would not explain why the students would praise the assignments in the first semester, knowing that they were about to face another semester of the same thing.

I think that the value of this type of assignment is beyond disput,e but I want to argue that they achieved several unintended results as well. I allowed students to repeat assignments until they were correct because of the way Toby Fulwiler insisted on the importance of revision in the writing/thinking process. It intrigued me to think that if I followed this I could know for sure that even those students who left the course with a D really understood the 20-25 most important concepts in physiology. Most of the mistakes that people made on the assignments were too complicated for a simple written explanation so many of the students had to have repeated personal conferences with me. Most instructors find that the students that come to see them the most are the ones that need them the least. In my class, the students that had the most difficultly with the concepts had to see me quite often. I think that these "Socratic Sessions" were of immense value to those students. They gave the students a sense that I knew personally what they were struggling with and that I cared. Some of them might not have cared themselves, but they didn't want to let me down.

Another unexpected benefit of these assignments was that they adjusted themselves to the ability of each student. The poorer of the students had to struggle but were ultimately capable of meeting the requirements of the assignments. The assignments also left a great deal of room for creativity and challenged even the best students. Some examples of particularly creative papers can be found in Appendix E.

It would be dishonest of me not to say that the grading of these assignments required a great deal of time. But, if you wanted an easy job, you shouldn't have gotten into teaching in the first place. If you didn't think that incorporating more writing into the curriculum was of critical importance you wouldn't be reading this anyway. What I would like to suggest is that if you are going to add writing to a science course you should do it in a way that gets the most benefit from your investment (and that of the students.) The real value of writing is in the way it forces you to think and learn in coherent, organized patterns. If you incorporate writing only as a means of evaluating students you are wasting a substantial part of your efforts. If you are trying to choose between adding essays to your exams and adding the type of assignments I have described here, I think your efforts will be much more richly rewarded by the latter.

APPENDIX A
HUMAN ANATOMY AND PHYSIOLOGY WRITING ASSIGNMENT INSTRUCTIONS

Human Anatomy and Physiology
Writing Assignment Instructions

You will be asked to complete a writing assignment each week (14 total). These writing assignments are designed to help you understand some of the more difficult concepts in physiology. They will usually begin by briefly explaining the concept and then proceed to ask you to find an example of that concept in action. Students often understand my examples of physiological concepts without understanding the underlying concept itself. By developing your own examples you can demonstrate an understanding of that concept.

You will normally have to find examples outside the field of biology. This insures that you understand the concept and not just the example but it is also a good way of learning. You should look to your everyday life to find examples of these concepts. If you find analogies between new concepts and things that you already know, it is much easier to learn and remember the new concepts. You will find that you already understand much of physiology, you just don't know it yet.

Length - The assignments need not be very long. A few paragraphs will usually be sufficient to answer all of the question. Length is unimportant as long as all the questions are answered.

First Draft - Write your first draft on the page I hand out that has the question on it. Before you give me the copy you want graded you must have your first draft evaluated by a student consultant.

Student Consultant - Before you hand your paper in to me I want you to be able to convince one of your fellow students that it is correct. This will give you the opportunity to see other examples besides mine and your own and help you learn the revision process if you don't already use it. It will also force you to interact with your fellow students in a way that I hope will cause the spontaneous formation of study groups.

Student consultants must identify at least one positive aspect of the first draft and at least one area that needs revision. The consultant must then sign the paper.

You may not use the same consultant more than twice during the semester.

Graded version - The graded version of the assignment must be typed. It can be on the front or back of the assignment sheet if there is room or on another page attached to the assignment page. The graded version should incorporate the consultant's suggestions and grammar and spelling count.

Further revision - If the graded version is not correct you will be given the opportunity to do it again until it is correct. If you have to do further revisions you must use a different consultant each time. When you finally get it correct, you will receive full credit. Otherwise you will not receive any credit.

Overlining - In answering essay-type questions students often have difficulty answering each part of the question without a lot of bullshit. Overlining is a technique you might use to help you. Use several different colors of overliner pens and overline each part of the question in a different color. Then overline the part of the answer that pertains to each part of the question in the corresponding color. A color that appears in the question and not in the answer has not been answered. Parts of the answer that are not colored are bullshit.

APPENDIX B
BIOLOGY 141 - HUMAN ANATOMY AND PHYSIOLOGY I

Biology 141 - Human Anatomy and Physiology I

First Writing Assignment Fall Semester 1991

Name ______________________________ Biology 141 ______________
section number

In feedback systems, the end product has an effect on the system that is producing it. In negative feedback, excess product will cause the system to slow down and produce less, while insufficient product will cause the process to speed up and produce more. This tends to lead to a stable output. Your body uses negative feedback to maintain a constant body temperature. If you get cold, it causes your body to produce more heat. If you get hot, that will cause your body to produce less heat. Negative feedback systems are very important in Homeostasis.

Find a non-biological example of negative feedback. Briefly explain your example being careful to identify the system, the product, and the interaction between them that makes this an example of negative feedback.

Remember that the assignment must be typed and that grammar and spelling count. If you choose to type it on a separate page, please be sure to attach this page.

Positive aspects:

Areas for revision:

Signature of Student Consultant ______________________________

APPENDIX C
EXAMPLES OF WRITING ASSIGNMENTS

Examples of Writing Assignments

#1 In feedback systems, the end product has an effect on the system that is producing it. In negative feedback excess product will cause the system to slow down and produce less, while insufficient product will cause the process to speed up and produce more. This tends to lead to a stable output. Your body uses negative feedback to maintain a constant body temperature. If you get cold it causes your body to produce more heat. If you get hot, that will cause your body to produce less heat. Negative feedback systems are very important in Homeostasis.

Find a non-biological example of negative feedback. Briefly explain your example being careful to identify the system, the product, and the interaction between them that makes this an example of negative feedback.

#2 In positive feedback excess product tends to cause the system to speed up and produce more. This increase in product further speeds up the system. Positive feedback tends to lead to instability. Psychologists often refer to this as the vicious cycle. I don't like that term because I think it sounds silly but the concept is essentially the same. No change can continue to intensify indefinitely so positive feedback often leads to death or destruction.

Find a non-biological example of positive feedback. Briefly explain your example being careful explain how a change leads to more intense change. Also, explain what eventually stops the positive feedback loop.

#3 Choose any one of the properties of water that we discussed in class. In your own words and in one sentence explain what that property is. Find some situation or activity in your life that is influenced by that property and explain it. Remember that the assignment must be typed and that grammar and spelling count. If you choose to type it on a separate page please be sure to attach this page.

#4 Choose another one of the properties of water that we discussed in class. It must be a different one than you did for writing assignment number three. In your own words and in one sentence explain what that property is. Find some situation or activity in your life that is influenced by that property and explain it. Remember that the assignment must be typed and that grammar and spelling count. If you choose to type it on a separate page please be sure to attach this page.

#5 Choose one of the factors that effects the rate of diffusion. In your own words and in one sentence explain how that factor effects the rate of diffusion. Find some example of diffusion in your life and explain how you can use your knowledge of the above factor to influence the process.

#6 In class we discussed how temperature and saturation effect the fluidity of lipids (or any other fat.) Choose one of these and describe it in one sentence. Find some situation or event in your life that is influenced by this and describe it in a few sentences.

#7 The larger something is the smaller its relative surface area (ie. the surface to volume ratio decreases.) In class we discussed how this principle sets an upper limit to the size of a cell and how it affects temperature regulation. Find some other instance where this principle is operating and explain it. (HINT- The best size for something is often determined by surface to volume ratios. Find any object and think about why it is the size that it is. How do surface area and volume affect the way it works?)

#8 In class we discussed how counter-current exchange could be used to conserve heat in the body. It can also be used for other things besides heat. Do one of the following:

1) Describe a situation (or a machine) in which counter-current exchange (of heat or anything else) is used to make some process more efficient.

2) Redesign a machine or a body part using counter-current exchange (of heat or anything else) to make the machine or body part more efficient. It may be useful to include a drawing of your design but you should also describe it briefly in words.

#9 In class we discussed how different muscle fiber types are best for different sorts of activities. Choose some activity in your everyday life that requires the use of skeletal muscles. Explain the activity and write what you think would be the best type of muscle fiber for that activity. Be sure to justify your choice using the characteristics of the muscle fiber types that we discussed in class.

#10 In class we discussed how energy could be stored as potential energy and later released to do work. Find a situation (other than those discussed in class) where energy is stored for later use. Describe the situation and explain how the potential is stored and how it is released.

#11 Find two situations in which information is transmitted by nerves. What type of nerve (large or small diameter, myelinated or unmyelinated) would be best in these situations? Be sure to justify your answer.

#12 Design a reflex that would be useful to you in your everyday life. Make a diagram like the ones we have made in class and describe the reflex in words. Be sure to justify your choice of the number of synapses in the reflex and the use of inhibitory interneurons (if any). Please do not use a reflex that actually exists. I want you to be creative with this one. In the interests of creativity, you may invent sensory nerves and effectors that don't actually exist either.

#13 Describe an event in your life when your sympathetic nervous system was stimulated. Explain how you know that sympathetic nerves were involved.

#14 Find a food product that advertises that it is "low fat" or "low sodium". Briefly describe the product and the advertising claim. Analyze that claim using information from lecture or from the text book. Finally, make a conclusion as to the accuracy of the claim.

If you are analyzing a "low fat" claim, you will probably want to calculate the percentage of calories that comes from fat.

If you are analyzing a "low sodium" claim, you will probably want to calculate the percentage of the daily sodium requirement that is supplied by a **reasonably sized** serving.

If you want to analyze some other type of nutrition claim, clear it with me first.

#15 Digestive enzymes by their very nature are dangerous things to have around. This presents a serious problem to the cells that produce them. The solution is often to produce the enzymes in some inactive form and use another chemical to activate them when the enzymes are safely in the place where they are going to be used.

Find a situation outside of our class where this same strategy is used. Describe the strategy and explain why it is necessary in this situation.

#16 Read a newspaper. Find an article that you can interpret in light of information that you have gained from this course. Attach the article to this page and explain how your knowledge of anatomy and physiology influenced your understanding of the article.
(I give this assignment several times during the second semester.)

#17 Many people are able to live perfectly well with only half a kidney. A large portion of the liver can be removed without noticeably altering function. People can manage on only one lung. This has been called the "principle of redundancy." This name is somewhat misleading because it implies that you have more of something than you need. While this may be true under normal circumstances organs must be "designed" to perform under peak load conditions. Your normal activities may only require one lung but when the air raid siren sounds, the people with two lungs will be the first ones that make it into the fallout shelter. Rather than being redundant your lungs exhibit what I like to call "Peak Load Design."

Find a non-biological example of "Peak Load Design." Describe your example. Be sure to explain why it appears redundant under normal conditions but actually is designed to meet the requirements of the most extreme conditions it is likely to face.

#18 Describe an event from your life in which one of the following occurred:

1) A change in your breathing caused a change in your blood pH.
2) A change in your blood pH caused a change in your breathing.

Be sure to distinguish between these two possibilities when describing the event (it is sometimes difficult to tell the difference.) Also be sure to explain how and why the breathing and the pH changed.

#19 Red blood cells carry oxygen on their surface and must therefore have a large surface to volume ratio. However, they must also squeeze through very small capillaries so they must have a smooth surface. The biconcave disk represents a compromise solution to these two demands. The fact that structure and function are intimately related should not be new to you but structure is often a compromise between more than one function or more than one aspect of the same function. Find a non-biological example of a structure that represents such a compromise. Be sure to explain the demands of each function and how the structure represents a compromise between these demands.

#20 The rate of flow of a fluid is determined by the following equation:

Poiseuille's law- Flow rate = **¶ ?P r^4 / 8 v L**

-¶ is there because flow depends on cross-sectional area and ¶ is part of the formula.

-?P means the difference in the pressure where the fluid is and the pressure where it is going. It is part of the formula because pressure is the driving force for the movement of fluid. Fluid always moves down a pressure gradient and the larger that gradient is the faster the fluid will flow.

-r^4 Radius is the most important factor in fluid flow. Two of the r's are there as part of the formula for cross-sectional area. The other two describe how much resistance decreases in larger vessels. Anyway, when you increase the radius of a pipe you increase the flow rate by much more than you might expect.

-8 is just a constant that makes the math come out right.

-v represents viscosity. The thicker the fluid is the slower it flows.

-L represents length. The longer a pipe is the more wall there is to provide friction and therefore resistance. Resistance, in turn, impedes flow.

Find an instance in your day to day life where one of these variables influences the rate of flow of some fluid. Describe it being careful to explain how the variable affects the flow and why it is important.

#21 Your immune system has many mechanisms for fighting disease but one is often overlooked. Your skin is your first line of defense against invading microorganisms. Once a pathogenic organism enters your body your immune system must kill it and that requires some amount of energy and effort. You are spared the trouble of killing the vast majority of potential invaders because they never make it past the skin.

Describe an analogous situation. Potential problems must be met with several lines of defense the first of which is prevention. Briefly describe each line of defense.

#22 Your immune system cannot recognize invading microorganisms the first time you are exposed. It has to be sensitized on the first exposure so that subsequent exposures will yield a faster response. You do this by making antibodies that are specific to the invader on the first exposure. On subsequent exposures you already have the antibodies from the first time and can attack more quickly.

When a complex pattern has to be recognized it is often useful to use a "search image." You ordinarily build such an image on first exposure. Subsequent exposures then produce a faster recognition. Describe a system that uses "search images." Failing that, describe a situation in which you made use of a "search image."

#23 Pheromones are chemicals that are secreted by one organism and effect the behavior of another. They work very much like hormones except that they work at the organismal level rather than at the organ or tissue level. There is some controversy over whether Humans use pheromones. Many pheromones from other animals have been found and clearly identified as such but so far the evidence for pheromones in Humans is indirect.

Invent a pheromone that you think would be useful to Humans. You don't have to invent a chemical structure for it but be sure to explain how and when it would be secreted; how would the other organism (Human or otherwise) detect it; and how would the target organism respond to it. (If you want to get into the chemistry, think about how the type of chemical used would effect the way it is transmitted.)

#24 In computer programming one often uses default routines. These are instructions as to what to do in case the computer doesn't receive any other instructions. Human (and other) development often uses default routines as well. For example, development of the gonads and genitals leads to female parts unless information is received (the presence of a y chromosome and the presence of testosterone, respectively) that causes development to follow the male pathway.

Find a non-biological example of a default routine and explain it. Be sure to explain what happens when no information is received (ie. what is the default routine?), what type of information causes the alternate routine to be followed, and what happens when the alternate routine is followed. What is the advantage of this strategy in your example?

APPENDIX D

BIOLOGY 141 - HUMAN ANATOMY AND PHYSIOLOGY I

Biology 141 - Human Anatomy and Physiology I

Evaluation of Writing Assignments Fall Semester 1991

Biology 141-____________
section number

This is a research project to assess the effectiveness of the writing assignments you have done in this class. Please define each of the following properties of water in your own words and in just one or two sentences. **Also, please circle the number of the ones you got credit for on your writing assignments.**

Do not study for this. Just do it. It won't effect your grade and it won't even have your name on it. The results of this study depend on you doing your best without preparation. It shouldn't take longer than twenty minutes. When you have finished it please return it to the envelope on my door and check your name off on the list.

Define or describe:

1. Universal solvent-

2. Specific heat-

3. Heat of fusion-

4. Heat of vaporization-

5. Thermal conductance-

6. Expands on freezing-

7. Surface tension-

8. Greenhouse effect-

Questionnaire

Please answer the following questions:

Did you enjoy doing the writing assignments?

Do you think the writing assignments helped you to learn important concepts?

Which writing assignments were the most helpful to you?

Which writing assignments were the least helpful to you?

What other writing assignments would have helped you to understand important concepts?

What other comments do you have about the writing assignments?

APPENDIX E
BIOLOGY 142 - HUMAN ANATOMY AND PHYSIOLOGY II

Biology 142 - Human Anatomy and Physiology II

Sixth Writing Assignment Spring Semester 1992

Name ______________________ Biology 142 - L-3 __________
Section number

Read a newspaper. Find an article that you can interpret in light of information that you have gained from this course. Attach the articlle to this page and explain how your knowledge of anatomy and physiology influenced your understanding of the article.

Remember that the assignment must be typed and that grammar and spelling count. If you choose to type it on a separate page, please be sure to attach this page.

After reading about President Bush's concept of economic stimulation by adjusting the tax tables so that less withholding will be deducted from each pay, make me wonder if more than stupidity was involved here; maybe a form of anoxemia had take place. Was the president and his economic advisors blowing ducks or perhaps pearl diving?

The large economic cost to each employer to make these adjustments, as well as the money that will have to be borrowed when these funds are not coming in to the government, is adding more of a burden to the economy. By no means could $3.00-$10.00 a month make that kind of positive economic difference. I know poor judgement in policy making occurred, under estimating the publics intelligence was another mistake, but perhaps there is a possible physiological reason for this idiotic policy.

Positive aspects:

Areas for revision:

Signature of Student Consultant

Biology 142 - Human Anatomy and Physiology II

Eleventh Writing Assignment Spring Semester 1992

Name ______________________________ Biology 142 - ____________
section number

Pheremones are chemicals that are secreted by one organism and affect the behavior of another. They work very much like hormones except that they work at the organismal level rather than at the organ or tissue level. There is some controversy over whether Humans use pheremones. Many pheremones from other animals have been found and clearly identified as such but so far the evidence for pheremones in Humans is indirect.

Invent a pheremone that you think would be useful to Humans. You don't have to invent a chemical structure for it but be sure to explain how and when it would be secreted; how would the other organism (Human or otherwise) detect it; and how would the target organism respond to it. (If you want to get into the chemistry, think about how the type of chemical used would effect the way it is transmitted.)

Remember that the assignment must be typed and that grammar and spelling count. If you choose to type it on a separate page, please be sure to attach this page.

ASSOCIATED WORLD PRESS RELEASE ....
..........An incident in the Northern Sector confirmed another penetration of Earth's soligard barrier by aliens of Star m43. These aliens have the capability of secreting a pheremone released from tear ducts in the form of vapor mist, into the air range of their victim effecting the Hering-Breur reflex---the inflation reflex that regulates the depth of breathing. It immobilizes stretch receptors in the viseral pleura, bronchioles and alveoli, inhibiting any stimulation normally resulting from lung tissues being overstretched. Sensory impluses normally traveling via vagus nerves to the pneumatoxic area, causing the duration of inspiratory movement to shorten, are paralyzed. The victim, responding to the fear of the encounter and an attempt to flee, experiences an increased breathing rate and rapid pronounced lung expansion. This results in over expansion causing a pneumothorax. Over expansion causes the lungs to collapse, filling the cavities with negative pressure.

Until recently, there was no defense against this deadly encounter. Recent research has produced a synthetic chemical that activates together with a common chemical in the body and produces an pheremone that neutralizes the effect from the alien pheremone. The South, East and most of the Western sectors have been innoculated with this synthetic chemical. Conflicts and uprisings in the Northern sector have slowed the delivery of the chemical antidote. It is hoped all processing of the Northern sector will be completed by the end of this month ....April 10, 2142

Signature of Student Consultant ______________________________

Biology 142 - Human Anatomy and Physiology II

Sixth Writing Assignment Spring Semester 1992

Name ______________________________

Biology 142 - L-3____________
section number

In computer programming one often uses default routines. These are instructions as to what to do in case the computer doesn't receive any other instructions. Human (and other) development often uses default routines as well. For example, development of the gonads and genitals leads to female parts unless information is received (the presence of a y chromosome and the presence of testosterone, respectively) that causes development to follow the male pathway.

Find a non-biological example of a default routine and explain it. Be sure to explain what happens when no information is received (i.e.,what is the default routine?), what type of information causes the alternate routine to be followed, and what happens when the alternate routine is followed. What is the advantage of this strategy in your example?

Remember that the assignment must be typed and that grammar and spelling count. If you choose to type it on a separate page, please be sure to attach this page.

Mary left her office and worked her way towards the transport room. It had been a long day filled with meetings. She looked forward to just a quiet evening at home with Ted.

She glanced at her watch.....6:15 p.m. She knew Hilda was programmed to begin preparations for dinner at 6:00 p.m. sharp. She had neglected to leave an evening menu with Hilda this morning, but Hilda had a back-up system for just such an occurrence. What a life-saver that feature was! She had been thankful many times they had invested the extra money for the Deluxe Housekeeper model. It had been quite an additional cost but robots were a serious investment. God knows the horror stories she had heard about families trying to cut corners and investing in those economy models. She had been to a couple of disasterous dinner parties prepared by such "bluelight specials".....something to remember, that's for sure!

Mary could relax knowing that by 9:30 a.m. this morning, when no instructions had been processed by Hilda, the robot's automatic alternative programming (AAP) had switched in. By 10:00 a.m., items noted for this evening's menu had been researched, and ordered if needed from the local grocery for delivery. Usual preparation routine coincided with the alternative programming and everything just fell into place.

Mary knew the meal would be perfect and Hilda's AAP routine just as flawless as her planned routines. As she stepped into the transport tube to be beamed home to her apartment, the day was already draining away and only the anticipation of being with Ted was now on her mind.

Signature of Student Consultant ____

WRITING TO LEARN
IN
INTRODUCTION TO MICROCOMPUTER SOFTWARE

by

Gary L. Tusing
Professor of Business

Gary Tusing, a Professor of Business, has been at Lord Fairfax Community College since 1971. Both his B.S. and M.S. Ed. are from James Madison University.

INTRODUCTION

In the Fall of 1990 I was asked to participate in a grant received by Lord Fairfax Community College to incorporate a writing component into a selected course or courses. I accepted the challenge and chose CIS 150 (Computer Information Systems)--Introduction to Microcomputer Software. This is a first computer course for many students is predominately "hands on" and provides a working introduction to microcomputer software, microcomputer fundamentals, and applications. It includes a discussion of and experience with operating systems, word processing, spreadsheets and data base management. The course which includes lecture and laboratory time meets four hours a week.

This course was selected because I teach at least one section each semester. Students in this course come from a variety of backgrounds and may range in age from 16 to 70. The locality served by Lord Fairfax Community College is primarily rural and agricultural with the largest town having a population of approximately 35,000. Traditional students have a basis in computers from high school, but with the average student age around 30, most students are non-traditional and are looking for personal satisfaction and/or job improvement skills.

In the occupational/technical areas of education, knowledge is expanding in almost geometric proportions. Faculty face the challenge of incorporating more and more essential material into already crammed courses. And, employers want employees with skills other than job specific ones. For example, (Greathouse) reports that employers want positive personality traits and good decision making/problem solving skills. These traits and skills include good written communications abilities.

Therefore, in an effort to provide better prepared employees for the local workforce, as well as to enhance the student's ability to learn material, a T-T-W component was added to CIS 150--Introduction to Microcomputer Software.

THE PROJECT

In a course where it is difficult to cover the required material, adding another component obviously cuts into valuable time. However, the belief was that the time invested in the T-T-W component would be rewarded by increased and enhanced learning. I wanted them to use writing as an aid to enhance learning and to improve retention. Zinsser (Writing to Learn) reports that students said they understood a subject better by having to write about it. Howard and Barton (Thinking on Paper) concur, stating that the ability to express thoughts in written form helps the student to organize, explain, remember, question, express, relate, deduce and therefore aids understanding.

Since many authorities on learning believe and advocate that the ability to put thoughts on paper enhances and improves the student's ability to learn and understand material, I was interested in knowing if this could be done in a technical course such as CIS 150.

A search revealed that there was limited literature available on writing in the technical courses, especially in the business fields. The intent, then, was to create a study that would determine (1) whether writing would enhance and improve learning and (2) whether student's writing abilities would improve over the semester.

The project was conducted during the academic year 1991-1992 in two courses each semester. At the beginning of each course, a pre-course opinionnaire (Appendix A) was given to determine information about the students and their writing abilities. Of an original 80 students responding, 73 percent said that they enjoyed writing. Comments on the opinionnaire included: *(writing helped organize thoughts) (it was easier to express oneself in writing) (writing helps release thoughts in a creative way.)*

When asked "How well do you feel you express yourself in writing?" 24 percent said very good; 40 percent, good; 33 percent, fair; and 3 percent, poor. The opinionaire indicated that 64 percent felt that they had above-average writing skills and this was substantiated by the fact that they later said they had seen little improvement in their writing skills.

Students were asked to keep a journal in either a three ring binder or a spiral notebook. According to "Innovation Abstracts" (Vol, XI, Number 9), the use of journals is the second most frequently mentioned technique used by faculty for writing activities. (The free writing technique was first.) The journal was **NOT** for the taking of class notes, but for recording thoughts, reactions, experiences, HUH's, AHA's, WHY's, and responses to questions or comments I put on the chalkboard at the end of each class session. (Appendix C) The journal could take any form: diary, memorandum, letter, etc. (Appendix D) I did, however, require that the date and time of each entry be recorded. Students were given time at the end of each class session (usually five minutes) to make recordings but this was not the only time they could record thoughts. Periodically, I received the journals and the degree of completion counted for up to 10 percent of their final grade. T-T-W project really took the form of what Tchudi (as reported in Smit) calls "workaday" writing. This means writing that (1) is generally short and impromptu, not requiring large amounts of time, (2) is written primarily for the benefit of the student, and (3) does not require extensive instructor response (although I frequently made professional as well as personal comments back to the students.) TheT-T-W projects were reviewed when tests were given i.e., four times during the semester. Each test consisted of two parts a written part and a laboratory part. The time required to complete these tests was generally sufficient to enable me to review journals and make comments. Reviewing the journals weekly, or even daily, would have provided me excellent feedback on where students were having trouble. Frequent journal checks by the instructor could provide an additional source of daily or weekly quiz grades--although I feel that student's spontaneity and freedom of speech might, thereby, be lost. Students might feel that they have to give "correct" answers rather than express their feelings and thoughts. Since reinforcement of learning is associated with the amount of time that expires, immediately writing about what has been learned greatly enhances retention of content.

EVALUATION OF THE PROJECT

At the conclusion of each course, a Post-Assessment Evaluation (Appendix B) of the T-T-W component was given. A total of sixty students responded to open-ended questions about the project and then responded to the same questions in objective form on a scale of 1 to 5 with 1 being the lowest and 5 being the highest. The objective results are reported in the following table:

POST ASSESSMENT EVALUATION

	Combined Scores	Question
A.	3.27	I enjoyed doing the writing activities.
B.	3.28	The writing activities helped me understand the material better.
C.	2.57	More or different articles would have aided my learning.
D.	2.88	I express myself better in writing now than before.
E.	3.55	Keep the writing component as a required part of course.
F.	2.88	Keep the writing component as an optional compent of the course.

The majority of the students responded that they did, in fact, enjoy doing the writing activity and that the activity did enhance their learning (questions A and B). The number and difficulty of the writing assignments were appropriate (question C.) Only a few said they expressed themselves better after the course than before (question D). This may be due to the large percentage that responded that they already felt they wrote well. A large majority responded that the writing component should be kept as a required part (question E). Therefore, only a small number felt it should be optional.

Selected responses to the open ended questions included:

1. **DISCUSS WHETHER YOU ENJOYED THE WRITING ACTIVITY IN THIS COURSE.**

In the beginning I hated the writing assignment, but towards the end of this course I liked the writing project.

The writing activities somewhat helpful, but not of great importance.

I did not enjoy this activity. I felt it did not help me remember things any better--just an added burden. Completed it only for my grade.

Yes, I think it made me stop and think about what I was learning.

Somewhat, it did give me an outlet to express my frustrations, and discoveries, as well as asking questions which were puzzling.

Yes, I did because I had to really think about what I was doing. Many times I've had to journalize thoughts at a later time of day so I had to go back and think about what I had done.

2. **DISCUSS WHETHER YOU BELIEVE THE WRITING ASSIGNMENTS HELPED YOU LEARN THE MATERIAL AND IMPORTANT CONCEPTS.**

Yes, If I'd written more I'd of probably learned more. I could have spent more time than I did at journal entries. I found re-writing class notes into a notebook at home helpful to learn what we did that day.

I don't know if it helped or not as I believe I personally learn more from actual hands on as opposed to reading and writing.

I think honestly it helped reassure us of what we had learned for that day. Sometimes by writing things down our thoughts are made clearer.

I don't think that they necessarily helped me to learn.

I think the writing assignments helped learn where my strong and weak areas are and to work on my weak ones.

3. **WOULD OTHER OR MORE WRITING ASSIGNMENTS HAVE BEEN HELPFUL. EXPLAIN.**

Yes, the more I think and write down my thoughts the more I realize where I need work and what I'm really interested in learning.

No--I feel the assignments were adequate.

Instead of asking a question--propose a problem and have the students suggest solutions. Most of the time relate the problem to computers but every now and then find a brain teaser for everyone to think about.

No. I think they were fine the way they were.

There can never be "just enough." The more one repeats a process, the more proficient one becomes. "Repetition is the mother of learning."

4. **DO YOU BELIEVE THAT YOU EXPRESS YOURSELF IN WRITING BETTER NOW THAN YOU DID AT THE BEGINNING OF THE COURSE? EXPLAIN.**

No, I always write like I'm talking.

Yes, because after writing it down I got used to doing it and got better.

A little. I never was a strong writer.

I have always possessed a talent for communicating my thoughts, whether verbally or in written form. ..., one can only improve one's skills through practice.

I feel that I express myself in writing better now, but I need to improve more on writing.

5. **WOULD YOU RECOMMEND THAT THE WRITING COMPONENT BE RETAINED OR DELETED FROM FUTURE COURSES? EXPLAIN.**

Retained because you can remember better.

I would retain the writing component; I believe that it has been a big help to me.

Retained. Some people will express problems more openly in a writing format then a verbal one in class.

I think it should stay and be fine tuned a little.

It should be retained. I'm fascinated to look back on the journal in the beginning of the course and see the differences in my attitudes about computers.

6. **IF YOU ANSWERED "RETAIN" IN QUESTION 5, ARE THERE IMPROVEMENTS THAT YOU WOULD SUGGEST?**

Perhaps a short composition on the various units may have forced students to fully investigate and understand the class material.

No, everything was conducted very well.

The teacher should give a summary sheet on each unit and also a survey sheet to see what our dislikes are about them.

I would specify more clearly the topic of the day.

Maybe have students elaborate on potential problems even if they're not experiencing any.

7. **WHAT OTHER COMMENTS DO YOU HAVE ABOUT THE WRITING ASSIGNMENTS?**

It's encouraging to re-read here at the end of the semester and see how far you've come. I found taking thorough notes and keeping a journal to be helpful at test time.

In regard to the journals we were required to keep, I am very thankful to have kept one. I was able to work through problems by recording my feelings.

It helped me learn.

Journalizing is perceived by me as busy work.

If the writing assignment was displayed at the beginning of the class, we could think about it throughout the class.

CONCLUSIONS

The purpose of the T-T-W project was basically two-fold: (1) to enhance student's ability to learn the material, and (2) to aid students in their overall preparation for the job market. The results suggest that objective one was accomplished. Students reported that, in general, the T-T-W component (objective question B) enhanced and improved their retention of material.

The second objective, however, is not as easily verified; although a majority said they enjoyed the activities and that these aided learning, only a small number said that their writing ability improved. It is therefore not generalizable that the employability of these students improved from a writing skills viewpoint.

IMPLICATIONS

This was the first attempt of this instructor to incorporate a writing activity into CIS 150 other than essay and short answer questions on tests. Therefore, the results, conclusions, and implications are subject to further review and analysis. However, the results look promising. A few minutes at the end of each class spent in writing activities was an investment that I feel paid a good return. What appears to have worked in CIS 150--Introduction to Microcomputer Software has the potential, I believe, for working well in any course. I intend to incorporate more writing into my other courses as well as to continue the writing component in CIS 150.

APPENDIX A

PRE-COURSE OPINIONNAIRE

WRITING TO LEARN
PRE-COURSE OPINIONNAIRE

COURSE ____________ NAME ______________________________

1. Do you enjoy writing? Why or why not?

2. How well do you feel that you express yourself in writing?

   A. very good B. good C. fair D. poor

3. Do you enjoy Computers and working with them? Why or Why not?

4. Do you read articles related to this topic?

5. How often do you read articles related to this topic?

   A. never B. daily C. weekly D. monthly

   E. whenever I find one of interest

6. Do you question the content/accuracy of articles you read?

   A. always B. sometimes C. never

7. Do you normally ask questions in class? Why or why not?

8. If you could ask questions by writing them down on paper would you do it?

9. How do you learn new things best?

APPENDIX B

POST-COURSE OPINIONNAIRE

COURSE ____________________ DATE ____________________

WRITING TO LEARN ASSESSMENT

During this semester a Writing To Learn component was added to this course. Many educational authorities believe and advocate that the ability to put thoughts, ideas, etc. on paper enhances and improves student's abilities to learn and understand material.

Please evaluate the Writing to Learn activities included in this course by answering the following as completely, openly, and honestly as you can.

1. Discuss whether you enjoyed the writing activity in this course.

2. Discuss whether you believe the writing assignments helped you to learn the material and important concepts.

3. Would other or more writing assignments have been helpful. Explain.

4. Do you believe that you express yourself in writing better now than you did at the beginning of the course? Explain.

5. Would you recommend that the writing component be retained or deleted from future courses? Explain.

6. If you answered "retain" in question 5, are there improvements that you would suggest?

7. What other comments do you have about the writing assignment?

Using a scale of 1 to 5 with 1 being the LOWEST and 5 being the HIGHEST, circle the value that represents how you agree with the statement.

A. 1 2 3 4 5 I enjoyed doing the writing activities in this course.

B. 1 2 3 4 5 The writing activities helped me understand the material being covered better than not having the writing activities.

C. 1 2 3 4 5 I would have liked MORE writing assignments to aid my learning of the material.

D. 1 2 3 4 5 I can express myself better now in writing than I could at the beginning of the course.

E. 1 2 3 4 5 I believe the writing component should be kept as a requirement in this course.

F. 1 2 3 4 5 I believe the writing component should be kept but only as an optional component by those who would like to do it.

APPENDIX C

EXAMPLES OF JOURNAL STATEMENTS

EXAMPLES OF JOURNAL STATEMENTS

1. My thoughts about today are...
2. My thoughts about word processing are...
3. Today I learned ...
4. Editing documents involves ...
5. Today I learned to .... This will help me to ...
6. Word processing is fun because ...
7. The activity (s) that I have learned that I can use most is/are ... because...
8. Discuss what word processing means to you.
9. Using word processing has taught me how to ...
10. Discuss what you have learned about word processing
11. My first impression of Lotus 123 is ...
12. Today I learned how to ...
13. Discuss the differences between labels, values, and functions.
14. Discuss/describe the advantage of copy and move commands
15. Using Lotus will allow me to ...
16. Describe what Lotus commands you used today.
17. Discuss what spreadsheets mean to you.
18. My first experience with DOS ...
19. Describe/discuss DOS copy commands and processes.
20. Describe the concept of directories.
21. My first impressions of Data Base are ...
22. Discuss what DOS means to you.
23. Describe your experiences with data base today.
24. Describe the most interesting/useful topic you learned today in data base.
25. Describe one new concept you learned from doing data base labs today.
26. Describe what data base means to you.

APPENDIX D

EXAMPLES OF JOURNAL WRITING

RESPONSE TO STATEMENT NUMBER 1

January 13-92
10:50 am
Well I'm here. I've had the introduction and the usual forms to fill out. Hopefully it will all be this easy! Hah, Hah.

11:30 am
My thoughts for now are I'm feeling a little confident and at the same time a lot overwhelmed about what lies ahead. Never have been a "student" and coming back to school to learn about something I know nothing about-Oh well I'm in now so I think I can....I think I can....I think I can.

RESPONSE TO STATEMENT NUMBER 2

January 15
11:45 am
Today was fun once we got the computers going. I knew that there was a lot of things that could be done with a computer but I thought it would be more difficult but really if you pay attention and follow each step it shouldn't be that difficult. It's going to be an experience.

RESPONSE TO STATEMENT NUMBER 7

February 3
9:45 am
The activities that I have learned that I can apply most are setting the tabs & the margins. I have several papers coming up in English that I need this info for. It's still confusing to me, I tried doing the Guided Activities but couldn't figure all of them out even after class. Next class should help.

RESPONSE TO STATEMENT NUMBER 10

January 29
11:45 am
Since our first class (January 13, 1992), I have learned how to Boot up the computer, load and format diskettes, print documents, and many now commands. The following is a list of just a few of the new attributes:

Boldface
Underlining

center alignment

Flush-right alignment

It has been a great day. I feel like I've gotten quite a bit done today. I actually understand all the new commands, too!

RESPONSE TO STATEMENT NUMBER 11

February 17
9:45 am
My first impression of Lotus: Well I guess from what little I have seen or done today it looks like it is a very useful thing. It sure can hold a lot of information. It does look like something I will be able to use when I become a teacher (I can use it for my grades). If I can still remember by then and they haven't changed the computers too much.

RESPONSE TO STATEMENT NUMBER 14

February 26
11:45 am
Dear Dad,

Today we learned quite a few things. First we discussed Copy & Move operations. What timesavers!

We also learned that when we"re in a Relative Mode, formulas are relative to the columns they are in.

We can copy information into individual cells to other cells, and formulas, too. It was pretty easy. The Guided Activities are so helpful! I feel confident each time I complete one.

Lotus 1-2-3 is better than I'd expected!

Love,

Authors Note:

(The above student had recently lost her father and all of her journal entries took the form of a letter to him. She said the journals were not only helpful for the class but very therapeutic. She was very close to her father and his death affected her very much.)

RESPONSE TO STATEMENT NUMBER 17

March 8
9:45 am
Lotus will be useful to me because I will be able to use in future temp. jobs. Also, I will be able to use it in some aspects of the financial part of our horse business.

RESPONSE TO STATEMENT NUMBER 18

March 23
11:45 am
My first impression of DOS is that it"s not as interesting as WP or Lotus but more that it the bldg. block for all the rest of what we've learned. I haven"t looked at the rest of the unit yet, but so far DOS just explains why the computer does what it does.

RESPONSE TO STATEMENT NUMBER 20

March 30
9:45 am
Today I learned how to 1) make a directory, 2) copy files into new subdirectories, 3) delete files from directories, 4) delete directories, 5) rename files and to be very careful not to delete something from the wrong place! We also learned to check our disk and check or rename our label on our disk. This was a very useful lab for me because I have a lot of files on my A directory and I would like to remove or move some of them before it gets too cumbersome.

RESPONSE TO STATEMENT NUMBER 21

April 13
9:45 am
My first thoughts about Dbase are that it will be very useful for our business. I have used this before in some offices I have worked in before, but I didn't know what I was doing...luckily the menus were very user-friendly and I was able to do the data entry without a problem (most of the time). This will be as useful as word processing for our business.

RESPONSE TO STATEMENT NUMBER 24

April 22
9:45
The most useful topic I learned today was how to construct a report from a database file. This was useful because we can manipulate the data without having to write/type each piece of data or calculate each calculation. We entered "contents" of each column and re-titled each heading to make it understandable. We even entered calculations between columns and it worked!

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